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Journal of Electricity

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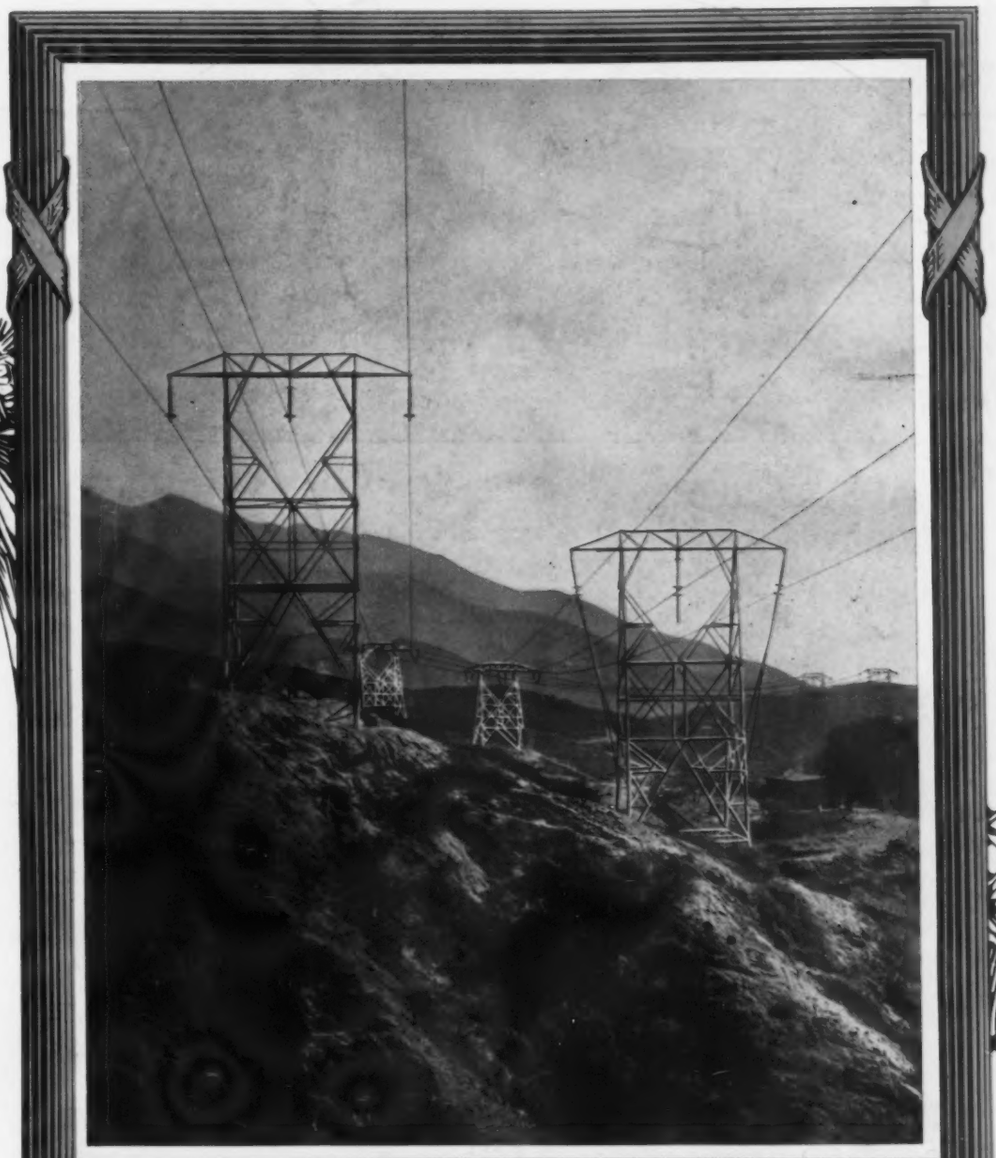

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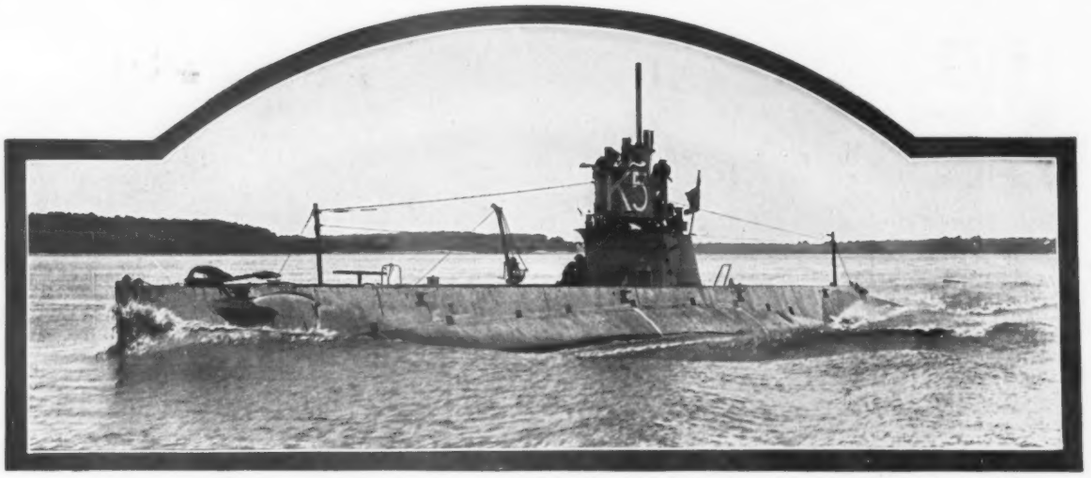

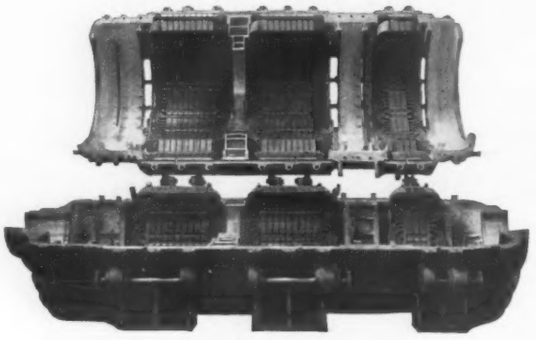

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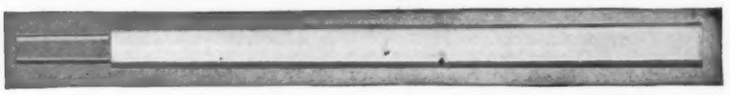

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Contents

Editorials 115

Central Station Energy at Work in Utah Coal Mines 121
By M. L. CUMMINGS, JR.
Electricity has proved its worth in coal mining by bringing about greater efficiency, reliability and economy of operation and by decreasing the hazards of the business.

Specializing in Retail Merchandising 124
By CLOTILDE GRUNSKY
That a strictly retail merchandising business can be successful is made clear in this article. The secret of success has been in the selection of lines and in the particular attention to detail.

Regional Review of the Power Resources for the Pacific Coast States 127
By A. H. MARKWART and H. A. BARRE
Excerpts from a paper presented before the World Power Conference, London, England, June 30-July 12, 1924.

Conventions and Their Byproducts 132
By WM. A. CYR
Reflections of a publicity director following the season of annual conventions.

Current Comment 118
Discussion 118
America Leads in Electric Brass Melting 133
The Coast Outlet 134
Jobber, Dealer and Sales Agent 140
Industrial News 142
Books and Bulletins 147
Meetings 148
Manufacturer, Dealer and Jobber Activities 149
Personals 150
Trade Outlook 152

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Data Book on Central Station Customers

HERE is an announcement that will be interesting news to our friends within the electrical industry. For some months our sister publication, the Electrical World, has been engaged in a comprehensive research for the purpose of determining the number of central station customers by states and counties in the United States. These customers include domestic, commercial and industrial, actual and potential, and with them is tabulated the population, so that the degree of penetration of the electrical idea may be determined not merely in each state, but in each county in each state as well.

It would seem that these data must prove immensely valuable to every institution within the electrical industry. By their use, manufacturers may set up their sales quotas, central stations may do the same, as well as see for themselves what sort of a showing they are making compared with other sections of the country. Advertising executives will find this work of great help in their market surveys and reports to their clients of market possibilities.

A book has been prepared by the McGraw-Hill Company presenting the result of this research in a systematic manner for ready reference. We believe that it will prove to be a most valuable addition to the reference library of all branches of the electrical industry, especially in the Western territory.

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Edison Rate Case
Reopened by Commission

THERE are responsibilities involved in commission regulation that work both ways. When the Southern California Edison Company was confronted with a set of conditions due to the unprecedented drought that indicated a loss in gross revenue for 1924 of some $5,600,000, it applied to the California Railroad Commission for relief. It was pointed out that the company was compelled to purchase from neighboring utilities such power as they could spare, and at prices considerably in advance of their own cost of generation under ordinary conditions. These facts, plus the generation of power from supplementary steam stand-by plants at even higher cost, placed the Edison company in a serious predicament indeed in its efforts to serve its consumers on the one hand, and keep the wolf from the door on the other.

Since the principle of commission regulation, as interpreted in California, does not permit of rates that will allow the accumulation of sufficient surpluses to tide over such emergencies, it would appear that the obligation of the commission to protect the stockholders and investors in Edison securities is just as binding as their obligation to protect Edison customers from the imposition of excessive rates.

Apparently a majority of the commission thought so, for an opinion was rendered granting a 10 per cent increase in rates for all service except agricultural beginning Sept. 1 next, Commissioners Seavey and Shore dissenting. Nevertheless, this minority dissent has resulted in reopening the case, the new hearings beginning in Los Angeles on Aug. 13 for the purpose of hearing additional evidence. We believe that the Edison company is justly entitled to consideration of its request. The evidence submitted will determine the amount. In the meantime, we hope that political considerations may not interfere with what seems to us a simple act of justice.

Good Goods
and Customers

IT is the resident population, not the transients, that makes a great community. By the same token, it is the customers, and not the one-time buyers that make success in a business enterprise. There is only one way to make a customer out of a one-time buyer, and that is quality goods—in other words, to render a service so satisfactory that the customer wants more of the same medicine.

Customers cannot be made by discourteous, slipshod business methods, nor can they be held by a so-called "bargain," that consists of a piece of shoddy merchandise, sold at a "reduced" price, that cannot perform its functions as the customer has a right to expect.

To solicit business, and to accept an order places a definite obligation on the merchant. The customer expects of the merchant truth in merchandising—that the goods shall be as represented, either verbally, in advertisements, or as implied by the very nature of the merchant's business. He is backing his faith in the merchant's honesty and sincerity of purpose by buying his goods. Caveat emptor may be perfectly good Latin, and an accepted principle of law, but in practice, it is the merchant that should beware, before he sell anything that converts his customer from an advertisement into an indictment.

The cheapest goods are quality goods. Dear goods are shoddy goods sold at a low price to one-time buyers on the principle that, as Barnum said, "One is born every minute." Great institutions, like the house of Tiffany, or Marshall Field, or Wanamaker, are erected on the former principle alone. Nothing of any lasting good was ever built upon the latter.

Proverbs—
Public Relations—Ashes

ORDINARILY we have little regard for proverbs. They attempt unsuccessfully to reduce the wisdom of the ages to a single sentence. The "rolling stone" metaphor, "Silence is golden," and all the rest of them are true only under specific conditions, and should not be considered as all-inclusive by the unpedantic seeker after knowledge.

It serves our purpose, however, to incorporate into this discussion one of the well-known maxims, which, when applied to the public relations phase of the central station business, contains enough truth to justify quotation. Here you have it, then, "It is the little things in life that count," and indeed, in the central station business, friends or enemies are made by a tone of voice, a facial expression, a word or a deed—things so small in themselves as to be scarcely noticeable at the time of their occurrence.

Among the "little things" we like to see around a central station office or salesroom, where customers come to do business, are ash receivers. The cigar and cigarette, thank goodness, are still tolerated in a land where the "chaw" is frowned upon and three per cent beer is a high crime, and one of the ways

for us smokers to keep the reformers from attacking our one remaining vice is to keep the process of smoking as clean as possible. Perhaps the subject is not worth an exhaustive survey but we venture to guess that nine men out of ten would prefer to deposit their tobacco ashes in a regularly appointed receptacle rather than on the floor or counter, and that five men out of the nine are so sensitive about the matter that their discomfort increases directly in proportion to the length of the ash. It is conceivable that the sale of a share of stock or of an appliance to one of those men may be lost because, in the absence of an ash-tray, he is nervously edging toward the door in the hope of arriving before the force of gravitation overcomes the tensile strength of a column of cigar ashes. You say this is far-fetched? Perhaps, but a great many of the things we do today to build satisfactory public relations were fetched a long way, so to speak, since the central stations first began to recognize the fact that the public relations problem was a problem.

Let us paraphrase the above proverb to suit our needs, and then you may accept or reject it as you will: Public relations, good or bad, is built on a multiplicity of little things.

Water Heating and the Electric Range

COMBINATIONS that promote through union the strength that the old copy book axiom would lead us to believe is most desirable are an interesting subject for thought. Ham and eggs, pork and beans, even liver and onions tickle the palate of the gourmet in a way not possible for either if taken singly.

Combinations, where affinities are joined together in bonds of gastronomic wedlock, may also find application in more prosaic pursuits. Take the old-fashioned cook-stove, the coal burner. Every stove or range was regularly equipped with a so-called "water back," through which the bath water for the then conventional Saturday night function was heated. The stove with the water back was the ham-and-eggs of the domestic menage.

Its successor, the gas range, brought about a different situation to a degree. The gas flame was applied directly to the boiler in most cases, thus Reno-izing the functions of the preparation of food and the periodical bath, and doing away with the utilization of by-product heat. This was probably due to an advanced civilization, which demanded baths at more frequent intervals than were possible under the former arrangement.

Now comes the electric range, and its helpmate, the electric water heater. Should the manufacturer and his salesman, plus the central station, adopt the policy of insisting upon the installation of both as a logical and natural combination, or should they be satisfied with either as the case might be as constituting a course along the lines of least resistance?

New installations would obviously offer a clean-cut prospect for both the electric range and the water heater. Existing domestic equipment, where gas or coal are being displaced by electric equipment, is another problem. While it is not consistent, strictly speaking, for the electrical salesman to permit gas water-heating to remain in possession of the field while extolling the advantages of the electric range, for instance, yet, the greater the amount of money involved in the change, the greater the sales resistance, even to the point of keeping electricity out of the kitchen, if a 100 per cent job is insisted on at one time.

It would appear wiser to install one thing at a time, and then follow up a few months or so later, and make the job complete after the convenience and utility of electric heat in one application has had time to make itself manifest.

The Campaign for Better Lighting

THERE could be no better evidence of the broad, constructive attitude of the electrical industry toward those whom it serves than the recently formed Lighting Educational Committee for the purpose of promoting better lighting. This committee is made up of representatives of the electrical manufacturers, lighting glassware equipment, and in fact all those who contribute toward the production of lighting apparatus and fixtures. Its purpose is to bring about a more intelligent conception of the better lighting idea, its advantages, and its effect upon both home and industrial life.

It is through education that the committee hopes to accomplish these desirable ends. Financed to the extent of $500,000 contributed by the representative concerns engaged in the production of apparatus and lighting fixtures, the conduct of the affairs of the committee will be without profit, without the exploitation of any particular kind or type of apparatus or fixture, and will function in an advisory capacity only. To carry on the work, regional directors have been appointed, who will in turn give their time to this enterprise without compensation.

In order to create interest in the movement, an interesting campaign of education has been planned, including a prize essay for school children for which a $15,000 home will be the first prize. The entire world must benefit from this movement.

Money Will Not Buy Rainfall

THE California press recently carried the statement that Colonel R. B. Marshall, author of the Marshall plan for the storage and conservation of the waters of the state, has announced that had the Water and Power Act been passed in 1922, the present drouth and water shortage would not have been as serious as it is. Colonel Marshall further urges the people of the state to pass the Act at the November election, so that there may not be another shortage in the future. Certain other proponents of the Water and Power Act have made similar statements, and have even gone so far as to blame the water shortage and the resultant power curtailment upon the privately owned power companies.

The absurdity of these statements is apparent when even a cursory survey is made of the water

conditions in the state. The six principal power companies, having a reservoir capacity of approximately 800,000 acre-ft., showed a maximum storage of only 49 per cent of capacity at any time this year. In 1923 the maximum storage was 96 per cent of capacity. The Modesto-Turlock Irrigation District's Don Pedro reservoir with a capacity of 295,000 acre-ft. showed a maximum storage of 61 per cent this year. Two of the major water companies in the northern section of the state stored but 49 and 37 per cent respectively of their reservoir capacity. These nine utilities—power, irrigation and water—with a total reservoir capacity of one and a quarter million acre-ft., stored less than 635,000 acre-ft. of water this year or only 51 per cent of the capacity of the reservoirs. Not a single one was able to approach 100 per cent. In 1923 the water stored in these same reservoirs filled them to 91 per cent of capacity.

It is ridiculous to attempt to place the blame for the present water shortage upon an agency. And it is inconceivable that $500,000,000 or one dollar could have been spent this year to produce a single additional inch of rainfall, despite Mr. Hatfield and all the other so-called rain-makers.

Only a Brave Man Could Smile

A Western contractor-dealer recently worked up an attractive installation job, doing all of the electrical specification work, laying out circuits and attending to all of the multifarious details in connection with such work. He quoted a fair figure that would allow a thorough job and would return a modest profit. Throughout the entire transaction he acted in the best of faith with his client. When the quotation was filed with the owner, that individual—in this case a large concern—immediately made overtures toward a jobber of electrical material, these overtures looking to the purchase of the material direct from the jobber. The long and the short of the story is that the jobber sold the material direct to an industrial concern; going around the contractor, the industrial concern hired wiremen to do the work and the contractor lost the job. The contractor is still a member of the Courteous Service Club.

Lighting Schools Should Receive Support of the Industry

RECOGNITION of the need for educating the industry to better standards of illumination is contained in an announcement on another page of this issue that the Lighting Bureau of the Pacific Coast Electrical Association will hold two schools of illumination in San Francisco and Los Angeles during September. It is not the plan of the schools to make, or even try to turn out, illuminating engineers from raw material in two weeks. It is planned, however, to give those attending a thorough grounding in all of the fundamental and basic principles with which trained engineers work. Attendance will be from the ranks of the central stations, jobbers, contractor-dealers, architects and builders.

An interesting feature of the course will be that no fee will be charged but each student will be required to deposit $10 from which $2 will be deducted for each day that he is absent. This has been done to assure attendance by those who enroll. The attendance has been limited to 50 at each school.

The advantage to the industry in having a number of men in both northern and southern California well grounded in the principles of proper illumination needs no comment. The fact that the men who are to furnish the instruction in the course are donating their time makes it imperative that the industry support the schools. Such opportunities do not knock every day.

The Political Bearing of the Water Shortage

IF there has been any doubt in the minds of the people of the utility of interconnection of power lines, that doubt ought to be dispelled in the light of the existing emergency due to the water shortage. We have the interesting phenomenon of the situation of the Southern California Edison Company being helped at its southern end through the agency of the San Diego Consolidated Gas & Electric Company, at its northern end by the San Joaquin Light & Power Corporation who in turn are being assisted by the Pacific Gas and Electric Company.

This is cooperation in the highest meaning of the word, made possible by the foresight and initiative of the power companies themselves under private ownership. In the meantime, what bearing on the political situation will the water shortage have? Will the proponents of the California Water and Power Act attempt to take advantage of the irritation of southern California consumers at having their ordinary power requirements arbitrarily reduced one-quarter, and ascribe the difficulties to alleged shortcomings of private ownership?

Intelligence tests conducted by the army during the war showed that the average intellect of the enlisted man was that of a normal boy of twelve years of age. This same conclusion, conceivably, could be applied to the average voter, so, it would appear, this country is really being governed, through the exercise of the franchise, by grammar school children. Certainly those who have the signing habit when approached by solicitors for initiative petitions such as that in favor of the state ownership of water and power are not likely to represent any greater intellectual development than was disclosed by the army tests.

Such being the case, it would not be surprising if a feature of the forthcoming campaign would be an attack upon the power companies for not providing a normal rainfall in the winter of 1923-4. Truly, democracy has its drawbacks but the situation must be dealt with on the basis of conditions as they are. The initiative has come to stay. Every citizen of twenty-one or more years of age may vote without regard to his mental qualifications. There remains then the obligation on the part of the power companies and of the entire electrical industry to carry the true story to the mass of the people, that the states of California and Washington may not be Russianized.

Water and Power Act Publicity Arouses Comment

The publicity of the California State Water and Power League, the organization which is sponsoring the Water and Power Act, is causing much comment in the press of the state. In but few places is it meeting with approval and those journals which accord it space in their columns are either labor papers or are markedly radical in their leanings. Under the heading "Corporations and Their Men," the Santa Barbara (Calif.) Morning Press points out some of the weaknesses in one of the latest bits of propaganda which has been sent out by the league. The editorial follows:

The California State Water and Power League, organized to conduct the campaign in behalf of the proposed state water and power act which will be on the ballot next November, already has its publicity department going full blast and is bombarding the newspaper offices of the state with arguments in favor of the act. Some of these arguments are singularly effective in the direction intended by the league, and some seem to carry a "reverse English." For some time the league has been contrasting the salaries paid the chief executives of the big power corporations with those paid the governor and other high officials of the state. It points out that the president of the Pacific Gas and Electric Company and the president of the Great Western Power Company each receives a salary of $50,000 a year and that the president of the Southern California Edison Company receives $36,000 a year, while the salary of the governor of California is only $10,000 a year.

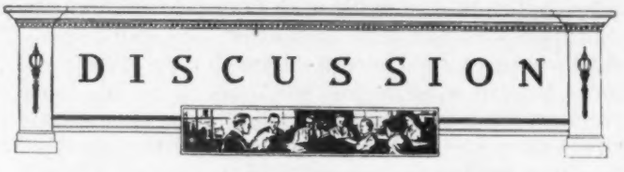
But isn't that a better argument for private ownership and operation of public utilities than it is for public ownership? The only argument on which private ownership has to stand is that it is more efficient than public ownership. If private ownership is the more efficient it is because the men at the top, those who control the great industries are more alert, have broader vision and are better administrators than the men placed in charge of publicly owned enterprises. And the one reason why the privately owned utilities are in the hands of the abler men is that the corporations pay better salaries than municipalities, states or the nation. Mortimer Fleishhacker of the Great Western Power Company, Wigginton Creed of the Pacific Gas and Electric Company and John B. Miller of the Southern California Edison Company draw impressive salaries probably because the majority of the stockholders in these corporations are convinced these executives are worth the money they are paid.

Before public ownership can ever be an unqualified success the public will have to make up its mind to pay salaries large enough to attract and hold executives of the caliber of the executives in control of the private corporations.

And here is another good word for the big corporations from a radical source. The editor of the San Jose News, who is popularly supposed to salaam reverently three times in the direction of Leningrad every morning immediately upon arising, was one of the hundred guests the Pacific Gas and Electric Company took on a joy ride to its Pit River development in Shasta County and he confesses that after "eating the corporation food, drinking corporation lemonade and looking at the corporation scenery" he came home in a somewhat chastened frame of mind. He has many kind things to say of the "forward looking, intelligent men" who direct the affairs of that corporation and of their love for the institution "which is genuine and profound," and he continues with this illuminating observation:

"It is really a wonderful organization. A man who would even dream of totally destroying such a splendid enterprise in human cooperation must be crazy; all the most radical person could possibly want to do, at bottom, is to arrange things so that such cooperation and organization would have still more opportunity to function for the good of the entire commonwealth. Whether such an arrangement can best be secured by having public ownership or regulating private corporations is a question for the future to decide; but the one big, important thing is that there shall be no senseless waste of the fine values already built up under private ownership—values social and political as well as financial. (Shucks, this sounds pretty conservative, doesn't it? We fear Franklin Hichborn will think the P. G. and E. lemonade has got in its deadly work.)"

What Mr. Burgess has to say concerning the P. G. and E. can be said with equal truth of the Southern California Edison Company, the Southern Counties Gas Company, the Southern Pacific Company and a score of other corporations in California. They have built up splendid organizations of men who have a boundless and beautiful faith in and loyalty to the companies they serve and a gorgeous pride in their work. These organizations represent values, intangible but nevertheless real, which should be preserved whether the verdict of the future is in favor of public ownership of utilities or regulated private ownership.



Engineer Presents Figures in Support of Los Angeles Aqueduct Grade

To the Editor:

Sir: The discussion by yourself and "Interested Engineer" of aqueduct grades, in your issue of July 15, seems to bring out the following essential facts, about which there can be no disagreement. That where the Los Angeles Aqueduct crosses the Antelope Valley to reach the Elizabeth Lake tunnel, a siphon 11 miles long with a maximum head of 400 ft. could have been substituted for the present conduit and siphon, which is 21 miles longer than the first named method of construction would have been; that as constructed the aqueduct delivers water a point 60 ft. higher than the long siphon would have done; that the 60 ft. gained by the present conduit makes possible the utilization of Fairmont reservoir; that the Elizabeth Lake tunnel is the outlet for this reservoir, and is situated so as to drain it, and utilize its full capacity; that the reservoir will have a capacity of 7,620 acre-ft. at the proposed flow line, and is now built to a capacity of 6,025 acre-ft.; that the tunnel is built to a capacity of 1,000 sec.-ft., and the aqueduct has only capacity for 420 sec.-ft.

Starting with these premises, I submit a tabulation of cost data derived from official sources, which shows that with the reservoir built to its full height, the excess cost of the aqueduct as constructed will be $1,213,578. This takes into consideration the matter of grades only, and does not include the cost due to increased size of the tunnel. I confined my criticism in my first letter to your statement that "millions" had been spent to flatten the grade of the aqueduct for the benefit of the power, and the "Interested Engineer" missed my point, when he spoke of the extra size of the long tunnel, accounting for one of the "millions." The increased length has been taken care of in my tabulation of costs.

Detail of Estimate, 11-mile siphon at Antelope Valley as against present constructed line. Statement of Cost as constructed:

Howard Contract,	58,080 ft. open ditch @ $14.30....	$ 830,544
	1,485 ft. tunnel 40.	59,400
Force Account,	87,766 ft. open ditch @ $11.10....	974,202
	21,794 ft. siphon	369,190
	Total,	$2,233,336
Estimate of 11-mile siphon across Antelope Valley:		
	21,794 ft. as above.....	$ 369,190
	36,286 ft. from 200-ft. to 400-ft. head, @ $23 per ft.....	834,578
Figuring the life of siphon at 40 years, and money worth 4.5 per cent, compounded annually, and that it would cost 25 per cent more to replace the structure, than the first cost, on the item of $834,578, it would be necessary to set aside $177,721 as a sinking fund. This added to the first cost, as follows		177,721
	Total,	$1,381,529
Cost as constructed		$2,233,336
Estimated cost of siphon.....		1,381,529
	Difference in cost,	$ 851,807
Cost of Fairmont dam to date.....		270,971
Cost of lowering tunnel to present grade, which means 600 ft. longer tunnel @ $68 per ft.....		40,800
		$1,163,578
Fairmont dam at elev. 3,031, 5 ft. below proposed full height, has capacity of 6,025 acre-ft. Capacity at proposed flow line is 7,620 acre-ft. Cost per acre-ft. to date is $1,931.		
Estimated cost to complete dam to full height.....		50,000
	Total,	$1,213,578
Cost of storage per acre-ft. based on full reservoir		$ 1,591
Cost of Fairmont reservoir based on average of 8 reservoirs on aqueduct system, which when completed, will store 81,360 acre-ft. at an average cost of $57.26 per acre-ft.....		$ 436,321
Amount in excess of average cost of reservoirs, which Fairmont will cost		$ 777,257
Amount furnished by Power Bureau.....	$177,293	
Amount estimated to finish dam.....	50,000	
	$227,293	227,293
Total amount spent by aqueduct to build aqueduct on present grade		$ 549,964

I find that the average cost per acre-ft. of storage for 8 reservoirs at the lower end of the aqueduct system is $57.26. Applying this average as a credit to the extra cost charge shown above, with 7,620 acre-ft., we have a total credit of $436,321 for its reservoir value, leaving a net charge of $777,257, which possibly should be assumed by the power branch of the aqueduct. I find three-quarters of a million where you talked in "millions."

I am sure that all engineers will agree that the aqueduct was designed and built to give the highest efficiency both for water and power; that honest men can disagree as to the proper allocation of costs as between water and power, and it comes down to a matter of accounting and of opinion.

GEO. R. SHUEY,
Assistant Engineer, Department of Public Service, City of Los Angeles.

Independence, Calif.
July 31, 1924.

Story on Sacramento Steam Plant Recalls Old Memories to Engineer

To the Editor:

Sir: It is interesting to note in your issue of July 15, 1924, a description of the record installation of additional power capacity in the plant of the Pacific Gas and Electric Company, Sacramento, Calif., by Clotilde Grunsky.

The writer is particularly interested in this article as he was connected with the original installation of the Sacramento Gas & Electric Railway Company, both at Folsom and Sacramento under G. E. instruction and observation.

For the railway we were then getting steam power from the Capital Gas Company. The railway company owned the electrical equipment.

As soon as our substation was completed, it was necessary to make a quick transfer of the electrical apparatus to prevent as little interruption to service as possible. This was done between 12 midnight and 7 a.m. the same morning, we having elsewhere erected a temporary plant to prevent curtailment of the entire service.

In one week from the time this transfer was started, we were giving full car service from our own plant.

The city arc light system was transferred to us and this was completed and in operation in 30 days from the day of placing the order.

It is gratifying what results can be obtained by proper cooperation and understanding, and I am pleased to know that the Pacific Coast maintains its record.

In addition to the above we had an "Electrical Carnival," created by the citizens in view of the incoming power, which was carried through to success due to the high type of G. E. apparatus even in those days.

T. A. W. SHOCK,
Construction Engineering Dept., General Electric Company.

Schenectady, N. Y.
July 29, 1924.

CENTRAL station energy has greatly simplified the work of the Utah coal miner by speeding up the mining and grading processes. Such devices as the electric engine, capable of hauling sixty loaded coal cars, have taken the place of the mine mule. Other operations have also been electrified.

Central Station Energy at Work in Utah Coal Mines

By M. L. Cummings, Jr.

***ELECTRICITY** has played an important part in the development of Utah's coal mines. To the casually informed person it would seem that the mining company, with a large supply of cheap fuel, would be in an excellent position to generate its own electric power. That such is not the case, as is shown by the fact that the majority of the producers purchase energy from a central station, is brought out, together with the operators' reasons for relying upon utility company service.*

THE coal mines of Utah, most of which are located in Carbon and Emery Counties, represent a large proportion of the state's resources. In the mining of the product of these mines electric power, purchased from a central station, has brought about greater efficiency, reliability and economy than can be obtained through any other method of operation. This is clearly demonstrated by the fact that practically all of these coal mines purchase electric power, even though they have an unlimited supply of cheap fuel at hand which could be used in operating their own steam generating plants.

The power is generated at various hydroelectric stations on the Utah Power & Light Company's system in the states of Utah and Idaho. A large portion of this energy is transmitted from Idaho to the power company's Terminal substation, near Salt Lake City—a distance of 130 miles. At Terminal it is stepped down to a lower voltage and again transmitted to another substation at Helper, which is the center of distribution for the coal mining territory. The distance from Terminal to Helper is about the same as from the power company's main generating plants to its Terminal substation.

A total of fifteen producing coal mines in the Carbon and Emery County districts are now using purchased electric power in their operations. They are as follows:

Cameron Coal Company
Carbon Fuel Company
Independent Coal & Coke Company
Kinney Coal Company
Liberty Fuel Company
Lion Coal Company
Peerless Coal Company
Spring Canyon Coal Company
Standard Coal Company
U. S. Fuel Company (Hiawatha Mine)
U. S. Fuel Company (Panther Mine)
Mutual Coal Company
Utah Fuel Company (Castle Gate Mine)
Utah Fuel Company (Utah Mine)
Utah Fuel Company (Sunnyside Mine)

Three Reasons for Purchasing Power

There have been three principal reasons why the greater proportion of the Utah coal mining companies have deemed it advisable to use central station energy. In the first place, they have realized that the primary object of any business is to prepare a product for the market in the most efficient and economical manner possible, and secondly, they have seen the advantage of eliminating all operations that do not contribute directly to the success of the business. The generating of power is not a part of the coal mining company's business and for this reason the central station has been called upon and energy is purchased at a very low cost per ton of coal mined. The money which would have necessarily been invested by the consumer in power plants to generate his own power, is free to be used in the actual mining

Drilling hole for blast charge in wall of solid coal.

Electric locomotive with train of loaded cars ready to be taken to the surface. These locomotives will haul from 50 to 60 cars of coal.

of coal and is made to work with the other capital. Also the working organization of the coal mine is enabled to put its entire efforts into the production of coal, and need not divert a portion of its force to engage in another business with which it is not in any way allied.

The third factor favoring the purchase of energy is the fact that the demand for power in a coal mine rapidly increases as the operations become more extensive, and more power is required for haulage, cutting and ventilation. Such additional power is immediately available from the central station, at relatively small expense, where the mine is operated under purchased power, whereas the consumer that is attempting to supply his own power requirements is confronted at regular intervals with the necessity of increasing his investment in his power plant in order to take care of his growing load.

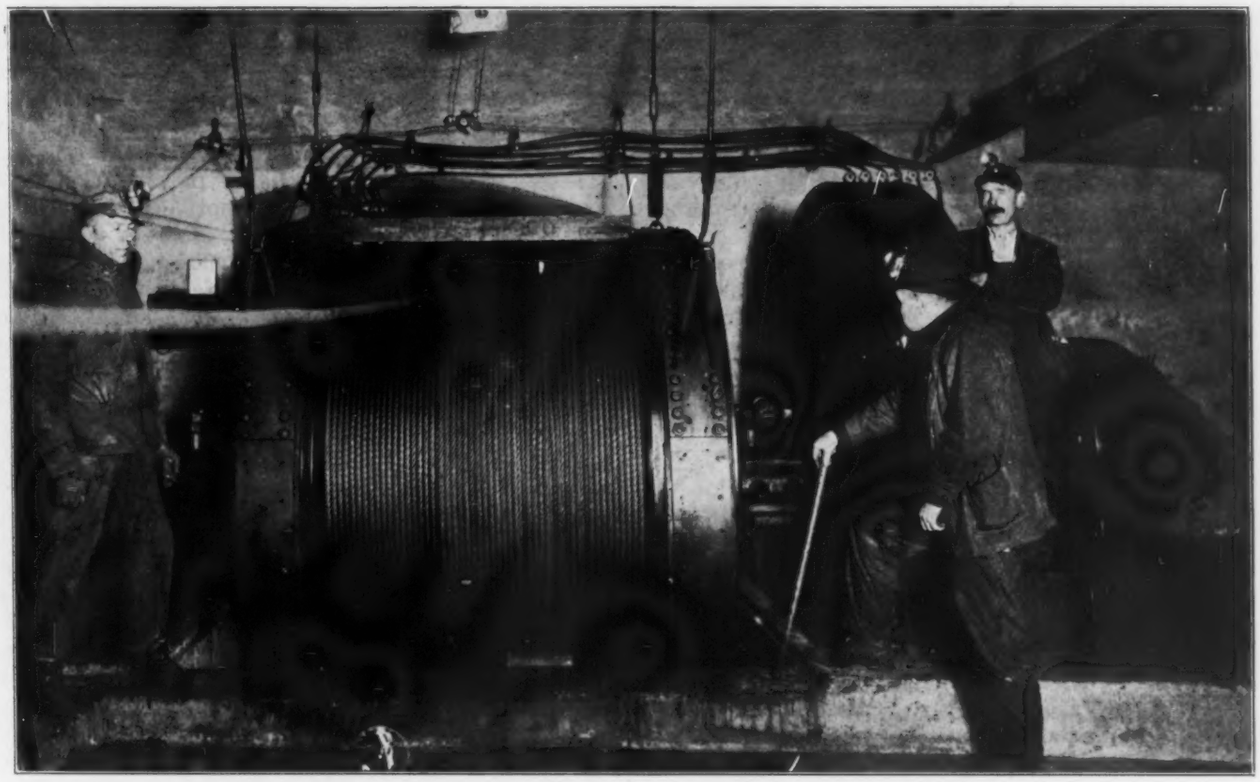
Under the coal mining laws of the State of Utah, the mining of coal would be impossible without electric power. Present limitations as to the method of mining are such that the use of mining machines for cutting the coal is absolutely essential, and the use of electricity for firing the shots to break down the coal is necessary.

Equipment Used in Utah Mines

The method of using mining machines and their construction vary somewhat with the type of coal and the thickness of the seams, although in most of the Utah mines a cut is made under the coal near the bottom of the seam. The cut extends across the face of the coal 6 or 8 in. wide and 6 ft. into the seam. This method of mining makes it possible to break down the coal with the minimum amount of slack coal resulting. This procedure is used in mines where the seam of coal is not too thick. Some of the mines in Utah have very thick seams of coal, one in particular having a seam practically 22 ft. thick. In this type of mine a different mining machine is used. It is so constructed that a cut across the face of the coal, similar to the one described above, is made 7 or 8 ft. from the floor.

Some of the coal mines in Carbon and Emery Counties receiving purchased electric power have

Coal cars being hoisted up an incline preparatory to being hauled from the mine to the portal by electric locomotive.

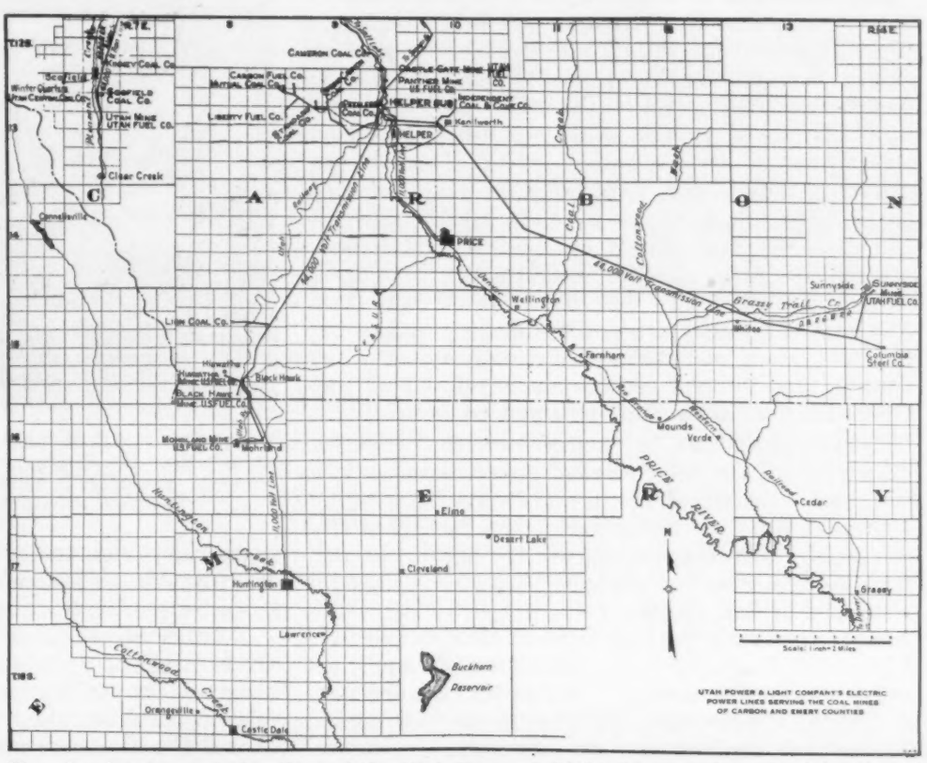


Underground electric hoist in the Utah Fuel Company mine at Castle Gate, Utah.

been operating for a number of years and the underground workings extend over a large territory. This results in the requirement of an enormous amount of fresh air for ventilating the mines. A large amount of ventilating equipment is installed in each mine and the fans are electrically driven. The long distances within the mines also make necessary the transportation of the coal inside the mines by trains of cars drawn by electric locomotives.

The coal found in Carbon County usually lies in comparatively flat seams from 7 to 20 ft. in depth, the plane of which, in general, dips 7 to 15 deg. to the horizon. Coal is usually found outcropping on the side of a mountain and the method of mining is to follow the vein or seam of coal along its dip into the side of the hill. This means that some mines must necessarily hoist their coal up the incline of the seam to the surface, and in others the loaded cars may be dropped from the seam if the mine has been opened on the lower side of the dip. Mines of this latter character use a considerably smaller amount of power than the mines which require the hoisting of the loaded cars.

It has become the custom of coal mining companies in Utah to prepare the coal as it is mined, into a number of classifications for the market. These



Map showing transmission lines of the Utah Power & Light Company in coal mining district.

classifications include slack, various kinds of pea and nut coal and various sizes of lump coal. This means that all coal coming from the mines must be screened and graded. The classification is done in a tipple which consists mainly of a series of screens with different sized meshes. These screens are set on an angle and vibrate in such a way as to roll the coal as it moves down the screens. The coal is dumped from the mine cars onto these screens and the desired classification is made. These tipples use a considerable amount of electric power in their operation. One tipple in the Carbon County district is so equipped that coal may be dumped and graded into five classifications and loaded on the cars in one operation. The loading of cars is done mainly by conveyors, although the loading of box cars requires a certain type of coal loader and electric power is used for its operation.

During the year 1923 there were 4,485,422 tons of coal mined in Utah, of which 3,419,455 tons, or 76.4 per cent, were produced by purchased electric power, with an average consumption of about 5¾ kw-hr. per ton of coal mined.

In taking advantage of the efficiency, reliability and economy of purchased electric power, the coal mining operators of Utah are keeping step with the progress being made in other lines of industrial activity throughout the state.

Specializing in Retail Merchandising

By Clotilde Grunsky

IT has become a traditional thing in the electrical industry for the electrical dealer to have a side line. The reason for this is no doubt the fact that the turnover on electrical goods and the margin of profit offered are not so great that he feels satisfied with the business done in the electrical appliance field alone. The question then arises, what shall it be?

Traditionally, he is supposed to go into the electrical contracting business. Because of his interest and knowledge of electricity, it is assumed that he will of course be prepared to wire homes and office buildings with the success which comes with a special gift for that sort of thing. The matter is also supposed to work conversely, so that the electrical contractor takes up the selling of home equipment to round out a career which likewise held insufficient profits for a livelihood. There was some sort of theory that the profits on one end of the business would fill up the valleys on the other—but there was no unanimity of opinion as to which field furnished the profits.

It is safe to say, however, that a man usually succeeds best in that line of endeavor in which he is interested—and that if his contracting business was added only as an afterthought and if he regards it only as a necessary evil, it will profit him little. The same is equally true of the dealing end of the business when undertaken by a man whose every training and interest centers about the wiring jobs which his firm is handling or about to secure.

The distinguishing feature of the electrical dealer as against the electrical department, as it is sometimes conducted in the hardware, drug or department store, is undoubtedly the fact that the electrical dealer does understand the subject of electricity—he knows the technical side of the goods he sells and he can service them properly when they later require repair or replacement. This is an essential feature to good electrical salesmanship and is the argument for the particular support of the specialty as against the non-specialty avenues of distribution. The second requirement for successful salesmanship—and one quite as important as the first—is a thorough knowledge of merchandising principles. And here it is that the hardware man and the department store head sometimes have the advantage over the electrical man. When you do have a man who combines a technical knowledge of the field with a liking for sales technique, the result is a gift of the

Exterior of the F. O. Lantz Company store at Long Beach, Calif. Note the display of refrigerators in the left hand window. The effect is secured by having the display window floor and the store floor on the same level.

gods and the man should not be discouraged in any way because he may not be complicated by a desire to be an electrical contractor.

Other storekeepers do not have to supplement the earnings of their business by growing the flowers they sell—or building garages to house the automobiles upon which they get their commission. Why should the electrical merchant, if he really be one,

not stand or fall by his success in his own recognized business of selling? And if it be true that he finds it difficult to make both ends meet on the margins and the turnover possible for electrical appliances in his district, would it not be more logical, rather than to go into contracting, to add other lines to those he carries, making a specialty of gas appliances or hardware or furniture, just as the hardware store and the furniture dealers have in their turn made specialties of the electrical appliance?

F. O. Lantz, of the F. O. Lantz Company of Long Beach, Calif., has worked out a philosophy along somewhat these lines—and has started a fashion which has had numerous followers. His store is one of the most progressive in the southern California district of progressive and attractive stores. It is located on the main street of Long Beach and is a dealer's establishment pure and simple. Mr. Lantz is not in the contracting business. His interest is in the merchandising side of the game and he sees no more reason why he should undertake the wiring of houses than why he should open an electric bakery and waffle kitchen. He believes that the man whose real interest is not in the contracting end of the business will make a poor job of supervising his men in the field. And he believes that if the work does not really represent himself, there will develop all kinds of "grief" and that it were better not entered into in the first place.

For the same reason, he has not gone extensively into the heavy appliance business, nor into the electrical fixture business at all. He regards both of these as specialty lines, better handled as independent work in their own right. The man who features electric washing machines and vacuum cleaners, for instance, can best establish himself on a side street, and with newspaper advertising and house-to-house canvass, can sell his goods to the household consumer irrespective of his location. The fixture business is a field all to itself. It requires a special type of display and store arrangement and, if it is to amount to anything, must include a complete stock. This means considerable capital investment and a special effort to merchandise this particular line of goods. Radio, for similar reasons, has come under the same ban.

New Lines Used to Stimulate Entire Business

The margin on lamps and the smaller electrical appliances which remain to make up the backbone of the business, however, is proverbially small and the turnover of necessity limited. What remains to meet the rent of a store in the main business district of town? In order to increase the diversity of materials carried and to bring people into the shop, and also because he felt that it was a logical combination, Mr. Lantz first added a line of gas heating and cooking appliances.

From time to time, he has added other features of household equipment, thus reversing the process of the furniture and hardware stores which have added electrical equipment as a side line to their particular line of goods. This material allows a good profit to the merchant, it has an excellent turnover and it brings people into the store. Mr. Lantz has kept accurate record of sales before and after adding the gas appliances, and it is interesting to note how sales in the purely electrical goods increased immediately upon this addition to the stock and have maintained their higher level ever since.

General interior view of the F. O. Lantz Company store. Gas appliances are displayed in a separate room in the rear and are not mixed with electrical devices.

The gas appliances are not mingled with the electrical equipment on the floor. In making a sales argument for an important appliance in either the electrical or gas field, it is sometimes distracting to

have a diversity of objects about, which catch the eye of the purchaser and divide the attention. In consequence a separate sales room for gas equipment has been added in the rear of the store. Customers will thus have a full opportunity to view the electrical equipment in entering and going out, but will still be allowed to concentrate on the gas equipment while that is being sold. On the other hand, the ornamental glassware, candlesticks and small articles of attractive appearance, calculated to attract passers-by into the store, are placed well to the front of the salesroom.

Store Is Arranged to Fit Circumstances

Mr. Lantz has given much thought to the general arrangement of his store in order that the customers may realize that the company is supplying up-to-date merchandising service to its patrons. To develop this impression he has endeavored to arrange his stock so that every piece of merchandise will have a definite place that will give it the best display possible. In making this arrangement the smaller devices are shown in cases located on the side walls of the store and the larger devices are placed in an orderly fashion down the center of the room. Wherever possible, the devices with metal fittings are kept in cases fitted with glass doors. This plan has been found to be particularly well suited to Long Beach as the salt air is thus kept from coming in contact with the metal fittings on such devices as percolators and toasters. Lamps and socket devices are kept in their original cartons and are neatly piled on shelves behind the main counter. Cartons that do not readily adapt themselves to display in the main part of the store are opened and their contents removed to heavy cardboard boxes that can be kept in a set of shelves designed to receive them.

Various ideas in store arrangement have been adopted which add greatly to the attractiveness of the store and at the same time help to sell goods. A well designed fireplace with home furniture is the central feature of a rest corner where a demonstration may be pleasantly conducted. Show cases, counters and shelves are arranged with taste and care. This store was one of the first to introduce the graduated lamp rack for the display of different types of lamps. In fact, the design of the particular layout invented by Mr. Lantz has been copied by one of the national manufacturers and spread broadcast throughout the country. In similar fashion, he was the first to adopt the use of a pyramided case of open box drawers used under the ordinary glass case for the display of small accessories. This design permits of the protection of the material from dust and tarnish and at the same time the complete display of the goods so that the customer may ask for an unfamiliar article without having to flounder about for words. At the same time, by sliding the tray back from its support like a drawer, it is easy to reach all materials from the rear of the case. This stand has also been copied very extensively in California electrical stores.

The store windows are given the attention they deserve. Recognizing the importance of light in windows and the effectiveness of color effects, the trough for the reflectors has been built into the window itself with a square frame into which the color screens may be inserted at will. One of the difficulties of most window displays is the fact that objects of different heights and sizes must be displayed in the same space. The floor of the usual show window is particularly designed for the exhibition of smaller objects and as a rule is somewhat inconveniently placed when full-sized furniture is

The counter holding flower vases and candlesticks is adjacent to that containing small electrical fittings and necessities.

to be used. The ordinary dining room table, for instance, is too high when placed in such a window and does not permit of the best display of the objects upon it. The same objection is to be made in the case of the gas ranges and similar bulky appliances, which Mr. Lantz desires to have always on display somewhere in his windows, but which stand too high from the floor to bring their surfaces at the most effective visual level.

In order to obviate this difficulty, Mr. Lantz has floored one side of his display window only. This window has a partition across the rear and is in every way adapted to the display of small appliances to the best advantage. It is usually devoted to electrical equipment and small glassware.

On the other side, the window is not specifically enclosed, but is a corner of the shop, as it were, with the floor at the level of the main sales floor and without rear partition. Here are displayed gas ranges, refrigerators and other of the larger appliances. In spite of the narrow space allotted, they do not appear crowded.and their surfaces, coming below the level of the eye, receive more favorable attention than would be possible otherwise.

The experiment of combining different lines of household goods with electrical equipment has been a success from the start. The electrical department still holds the center of interest and provides from 60 to 70 per cent of the sales, varying with the time of year. It is Mr. Lantz's particular interest and he has watched it grow, under the stimulus of the new custom brought to the shop through the other departments, with satisfaction. He still regards himself as a specialist, if not in confining himself to one line of goods, at least to one line of endeavor. He is a specialist in store merchandising.

Regional Review of the Power Resources for the Pacific Coast States*

By A. H. Markwart[1] and H. A. Barre[2]

THE hydroelectric resources of the three Pacific Coast states constitute 43 per cent of the water power of the United States, and under economic development will produce 104 billion kw-hr. annually. Less than 10 per cent of this is developed. The total is sufficient to supply a population of 23 millions under a consumption of 5,000 kw-hr. per capita, which is nearly five times the present use. The growth of load for this region during the past decade has been 10 per cent per annum, which is 3.5 times the rate of growth of population. California heads the United States in hydroelectric output.

Historical

The early development was non-industrial; therefore power was not urgently needed. Steam generated power was early used for urban lighting. Fuel oil has great industrial value, and has been largely utilized, but will never supplant hydro power.

Hydroelectric power development was the natural outgrowth of the hydro-mechanical power of the West. The growth in size of units and distance and voltage of transmission has since been phenomenal.

The first hydroelectric plant was constructed on the Willamette River, Ore., in 1889, with a 13-mile transmission at generator voltage. The Pomona plant in California, built in 1892, was the first long distance transmission with a stepped-up voltage. The Mill Creek No. 1 plant, near Riverside, Calif., in 1893, was the first polyphase transmission, and used 10,000 volts. The 142-mile Colgate line, in 1901, transmitted at 60,000 volts.

The general topography, dominated by various mountain ranges in excess of 10,000 ft., which materially influence precipitation and storage, is favorable to power development.

The remoteness of these mountain power sources made the development of high voltage transmission essential. With growth the amalgamation of small companies into larger systems resulted. This consolidation influenced the standardization of frequencies, the predominating being 60 cycles, which will doubtless be generally accepted throughout the United States.

Large Systems

The largest system in the West is that of the Pacific Gas and Electric Company with 3,492 circuit miles of transmission at voltages ranging between 30 kv. and 220 kv., fed by 474,550 kw. of plant capacity serving 311,615 consumers, residing in over 54,000 square miles of territory.

The next largest is the Southern California Edison Company with 2,072 circuit miles at similar voltages, supplied by 497,800 kw. of installed plant capacity.

Interconnection

Interconnection of systems throughout the Pacific Coast has been an established fact for a number of years. This permits the fullest utilization of water resources, reduces the amount of auxiliary steam and reserves to a minimum, and takes advantage of load diversity at the peak. The early motive for interconnection in California was, however, the desire to secure a market.

During the past two years the interconnection of the entire Pacific Coast has been effected, except for two small gaps, one of which is now being closed. With the closing of the last gap, a total of 1,867,485 kw., having a total annual output of 6,900 millions of kw-hr., will be interconnected.

In California there are 30 points of interconnection, none, however, in excess of 66,000 volts, the largest transfer being 25,000 kw. The Pacific Gas and Electric Company and the Southern California Edison Company furnish better examples of fully developed interconnections within their own systems.

The states of Oregon and Washington have also made notable strides in development and interconnection, as is indicated by the 1923 report of the Pacific Northwest Super-Power Committee.

The Pacific Coast interconnected system should not be understood as a superpower system. What actually exists is a physical interconnection of utility systems whose function is to dispose of surplus power, until load growth withdraws the surplus from the market.

Superpower cannot mean great reduction in cost of power to the consumer, since so much of the cost is in distribution and conduct of the business, but it will delay the inevitable increase in cost, as fuel becomes more expensive, and poorer power sites have to be developed.

No interconnection will exist without economic reasons or benefits to the consumer. When the benefits increase, the funds will be made available for larger interconnection.

The interstate power business is very small at present, but it will be tremendously increased by the development of the 3,500,000 hp. on the Colorado River, the largest sites of which are in Arizona. The international business over the Mexican and Canadian boundaries is also small.

There are no legal inhibitions nor embargoes against interstate or international business, the ma-

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[1]Vice-president in charge of engineering, Pacific Gas and Electric Company, San Francisco, Calif.

[2]Executive engineer, Southern California Edison Company, Los Angeles, Calif.

*Excerpts from a paper before the World Power Conference, London, England, June 30-July 12, 1924.

TABLE No. I.

AREA, POPULATION, HYDRO RESOURCES
AND
PER CAPITA CONSUMPTION OF ELECTRICITY
FOR PACIFIC COAST STATES

Item	California	Oregon	Washington	Total	New York
Gross Area, Sq. Mi.	158,297	96,699	69,127	324,123	49,204
Land Surface, Sq. Mi.	155,652	95,607	66,836	318,095	47,654
Population:					
1900	1,485,053	413,536	518,103	2,416,692	7,268,894
1910	2,377,549	672,765	1,141,990	4,192,304	9,113,614
1920	3,426,861	783,389	1,356,621	5,566,781	10,385,227
Inhabitants per Sq. Mi.:					
1900	9.5	4.3	7.8	7.6	152
1910	15.3	7.0	17.1	13.2	191
1920	22.0	8.2	20.3	17.5	218
Hydro Resources:					
Average hp.	5,500,000	4,500,000	6,000,000	16,000,000	1,400,000
Millions kw-hr. per annum	36,000	29,000	39,000	104,000	9,150
Hydro Production—1923:					
Millions kw-hr.	4,120	422	1,358	5,900	3,561

terial laws of trade functioning freely. The active demand within the state discourages interstate sales. The economic aspects are not unlike those governing the commerce in coal or other fuel.

Character of Load

On the 4,400,000 hp. of connected load on the 8,100 circuit miles of the California-southern Oregon interconnected system in 1923, 36 per cent was lighting, heating and cooking, 25 per cent was industrial, 15 per cent agricultural, 8 per cent railways and 16 per cent miscellaneous. The annual growth of connected load has been 10 per cent per annum during the past decade.

The saturation point is far off, since the Pacific Coast failed to manufacture sufficiently for its 5,566,000 population, by some $160,000,000 in 1919. New uses are constantly being found in the metallurgical, chemical, heating and transportation fields.

Regulation

In the West, as in most other parts of the United States, the power business is a monopoly within the area served by each utility company, regulated by state authority. The utility company carries the obligation to render good service and conduct its business in accord with sound business judgment. On the part of the regulatory body, the law requires that rates be granted to the utility company sufficient to meet reasonable operating expenses, depreciation and a fair rate of return on the capital invested by the utility used and useful in public service.

With the increase of transmission voltage and the resulting greater distances over which it is possible to transmit electric energy, interstate power in larger magnitudes will be accomplished, especially in those regions of the United States where concentration of water power in great volume exists.

TABLE No. II.

ANNUAL PRODUCTION OF ELECTRICITY BY PUBLIC UTILITY
POWER PLANTS IN THE UNITED STATES IN 1922

Based on Records of Division of Power Resources U. S. Geological Survey together with Population and Kw-hr. per Capita.

State	Produced by Water Power: Thousands of kw-hr.	Per Cent of State Total	Per Cent of U. S. Total	Produced by Steam: Thousands of kw-hr.	Per Cent of State Total	Per Cent of U. S. Total	Total Thousands of kw-hr.	Per Cent of U. S. Total	Population 1920	Kw-hr. per Capita
California	3,776,998	86.2	21.95	602,705	13.8	1.98	4,379,703	9.19	3,426,861	1280
Illinois	191,827	5.5	1.15	3,291,105	94.5	10.81	3,482,932	7.31	6,485,280	535
Indiana	49,263	4.6	0.29	1,027,681	95.4	3.37	1,076,944	2.26	2,930,390	370
Iowa	629,943	60.4	3.66	412,010	39.6	1.35	1,041,953	2.19	2,404,021	435
Massachusetts	361,147	19.5	2.10	1,488,764	80.5	4.89	1,849,911	3.88	3,852,356	480
Michigan	692,122	31.7	4.02	1,487,822	68.3	4.89	2,179,944	4.57	3,668,412	595
Minnesota	342,480	43.5	1.99	445,109	56.5	1.46	787,589	1.65	2,387,125	330
Missouri	29,250	3.4	0.17	841,776	96.6	2.76	871,026	1.83	3,404,055	255
New Jersey	2,003	0.2	0.01	1,110,435	99.8	3.64	1,112,438	2.33	3,155,900	350
New York	2,951,818	39.8	17.15	4,468,960	60.2	14.68	7,420,778	15.57	10,385,227	715
Ohio	30,937	1.0	0.18	3,011,951	99.0	9.89	3,042,888	6.38	5,759,394	530
Oregon	365,273	71.2	2.12	147,531	28.8	0.48	512,804	1.08	783,389	655
Pennsylvania	497,471	11.0	2.89	4,031,193	89.0	13.24	4,528,664	9.50	8,720,017	520
South Carolina	814,431	93.7	4.73	54,337	6.3	0.18	868,768	1.82	1,683,724	515
Texas	3,285	0.4	0.02	813,507	99.6	2.67	816,792	1.71	4,663,228	175
Washington	1,209,326	94.1	7.03	76,299	5.9	0.25	1,285,625	2.70	1,356,621	950
West Virginia	24,022	1.8	0.14	1,327,416	98.2	4.36	1,351,438	2.84	1,463,701	925
Wisconsin	499,921	45.6	2.90	594,541	54.4	1.95	1,093,562	2.29	2,632,067	415
Other States	4,735,848	47.6	27.50	5,219,397	52.4	17.15	9,955,245	20.90	36,548,852	270
United States	17,206,465	36.1	100.00	30,452,539	63.9	100.00	47,659,004	100.00	105,710,620	450
PRODUCTION IN 1923										
California	4,119,542	82.0	.....	922,100	18.0	.....	5,041,642	.....	3,426,861	....
Oregon	422,561	71.0	.....	172,762	29.0	.....	595,323	.....	783,389	....
Washington	1,357,757	94.0	.....	88,166	6.0	.....	1,445,923	.....	1,356,621	....
Pacific Coast	5,899,860	....	.....	1,183,028	....	.....	7,082,888	.....	5,566,871	....
New York	3,560,752	41.0	.....	5,156,151	59.0	.....	8,716,903	.....	10,385,227	....

Federal control has been limited to the administration of the Water Power Act, under which licenses are granted to develop power on navigable streams and federal power reserves. Interstate power business on a large scale may bring with it a greater degree of federal regulation.

But, federal regulation of interstate business, if it must come with growing superpower, is, with private control of the general regional power supply, more in the public interest than municipal or state ownership of separate power supplies. Either of these tendencies is a step backward, and is inimical to the growth of interconnection, which is the prime essential of superpower. Municipal ownership in principle is opposed to state superpower, while on the other hand state superpower tends to promote agitation for state ownership through agencies antagonistic to the institution of private property. Government ownership in this form is equally undesirable if there is to be a universal power supply and a free flow of power without regard to state boundaries.

What is really best, and what is in operation is ownership by the public, of the stocks and bonds issued by the regulated utility companies, these securities being held in relatively small amounts by great numbers of people. The principal gas and electric companies operating in California have in excess of 100,000 stockholders which is public ownership of a character that permits securing of all the known advantages of private operation. Interstate business in power which has been so easily carried on under private action through the kind of public ownership of utilities which exists, will be rendered impossible under municipal or state ownership of power supplies. Unhampered by state interference, interstate superpower will develop to meet the demand of interstate business, and in time may bring federal regulation, and to some it will suggest national ownership.

Interstate power retards state ownership, and even with the possibility of federal regulation, it should go forward to the extent that is required to meet the trade in power. Under private ownership alone, interstate power systems will develop, and power will be supplied to all users wherever situated, as active demand arises therefor. This has been the situation in the past, and there is no reason to believe but that the demands of the future will be met with equal success. Initiative and individualism which have functioned freely under public ownership of the character described, must not be suppressed, for these attributes have promoted progress in the electric power industry which have been in the development stage since its inception, and placed it in the enviable position it enjoys in the United States today.

Finance

The task of finding funds for the development of the immense water power resources of the Western states is not one which concerns only a few power company executives.

TABLE No. III.

OUTPUT IN KW-HR.
AND
GROWTH OF LOAD FROM 1920-1923
FOR
CALIFORNIA, OREGON AND WASHINGTON*

	California	Per Cent Increase	Oregon	Per Cent Increase	Washington	Per Cent Increase	Total	Per Cent Increase
1920	3,735,645	....	475,543	....	1,196,725	....	5,407,913	....
1921	3,982,938	6.6	468,534	—1.5	1,176,662	—1.7	5,628,134	4.1
1922	4,379,703	10.0	512,804	9.4	1,285,625	9.3	6,178,132	9.8
1923	5,041,642	15.0	595,323	16.0	1,445,923	12.5	7,082,888	14.5
Total increase	1,305,997	35.0	119,780	25.1	249,198	20.8	1,674,975	31.0
Annual increase	.....	10.5	.....	7.8	.....	6.5	.....	9.5

*Data from United States Geological Survey reports.

When it is stated that a billion dollars will be expended in hydroelectric construction in the states west of the Rocky Mountains in the ensuing ten years, of which $500,000,000 is to be spent in California alone, the figures are so large that the mind can hardly grasp their real significance; the statement, however, of the amount to be expended by California power companies may give a better perspective of the vital significance of this program to the electrical industry; and these figures, of course, are only a fraction of the increased business which will inevitably follow the growth of industry and population naturally consequent upon the creation of large additional quantities of hydroelectric energy.

It is no mere figure of speech, therefore, to state that the utilization of the inexhaustible energy now running to waste in the streams of the country is a matter of national concern.

The program of California's power companies, anticipating the expenditure of one-half billion dollars by the close of 1934 in the intensive development of her splendid hydroelectric resources, is the most comprehensive of any state in the Union.

Broadly speaking, there are only two methods by which capital funds may be secured by public utility companies, namely, from surplus earnings and from the sale of securities. It is impossible to realize from the earnings of electric utilities a sufficient sum to finance more than a small proportion of a construction program of the character here involved.

This means of providing for extensions is possible in the case of a large number of industries which are able to handle a considerable volume of business with a comparatively small investment, many concerns being able to turn over their invested capital several times a year. In the public utility business, however, the proportion of invested capital required to produce a given volume of earnings is

perhaps greater than in any other line of industry. It is a general rule that even the most conservatively financed hydroelectric companies are compelled to invest $500 in plants and transmission and distribution systems, etc., to yield a gross revenue of about $100 per annum. And in many cases the ratio of capital to income is higher than this.

It is true, however, that utility corporations plow back into their properties a substantial portion of their earnings each year through the medium of sinking fund payments, and depreciation and other reserves; but the bulk of construction funds must necessarily be obtained from the sale of securities.

Sale of Securities

Investors in corporate securities are of two classes:

(a) Stockholders who purchase an actual share in the company's business, and become partners in the undertaking.

(b) Bondholders who loan money to the company for a definite period of time, at a fixed rate of interest, their principal and income being secured by mortgage upon the company's property.

A corporation with a well-balanced financial structure usually issues both bonds and stock; bonds because on account of the security of the offering, money may be borrowed at comparatively low rates of interest; and stock, because the greater the amount of capital secured from the sale of this class of security, the larger will be the equity behind the bonds, and hence the lower will be the interest rate which must be paid to secure funds from the sale of bonds. It seems pretty generally agreed that the most economical method of securing capital for the conduct of a growing concern is to obtain from 55 to 65 per cent of the necessary funds from the sale of bonds, and the remainder through stock sales.

Limitations Upon Issuance of Bonds

While the issuance of bonds secured by mortgage upon physical properties is undoubtedly the cheapest method of securing funds, there are obvious limitations upon the issuance of this class of securities, and, generally speaking, the greater the restrictions placed upon the amount of bonds which may be issued, the better the security is regarded by investors, and consequently, the lower is the interest rate which has to be paid by the issuing corporation. Practically all the larger California hydroelectric companies have now adopted what is known as "open-end" or unlimited mortgages as being the most desirable and economical means of securing borrowed capital. The authorized amount of bonds which may be issued under these mortgages is made sufficiently large to cover the requirements of a number of years, and bonds are issuable from time to time in series bearing such rates of interest and dates of maturity as may be agreed upon at the time of issuance.

This form of mortgage is sufficiently elastic to cover changing financial conditions over a period of years, and has been adopted, substantially in similar form by the Pacific Gas and Electric Company, Great Western Power Company, San Joaquin Light & Power Corporation, The California Oregon Power Company and other utilities. Under the terms of the mortgage, the par value of bonds issued is limited to 75 per cent, or, in some cases to 80 per cent of

TABLE No. IV.

CALIFORNIA-OREGON-WASHINGTON-INTERCONNECTED SYSTEM
DECEMBER, 1923
Assuming gaps closed and interconnection completed

Company	Kw-hr. Output 1923 (In thousands)	Installed Capacity in Kw. Hydro	Installed Capacity in Kw. Steam	Plants under Construction (Kw.) Hydro	Plants under Construction (Kw.) Steam
CALIFORNIA-SOUTHERN OREGON					
Pacific Gas and Electric Company	1,726,000	309,850	129,500	89,100	.....
Southern California Edison Company	1,470,000	277,200	94,850	41,000	70,000
Great Western Power Company	575,000	110,400	30,000	22,000	.....
San Joaquin Light and Power Corporation	465,000	82,850	54,050	.....	.....
City of Los Angeles, Bureau of Light and Power	262,000	99,855	.....	.....	.....
Southern Sierras Power Company	206,000	41,375	9,450	17,700	.....
Los Angeles Gas and Electric Company	126,000	.....	43,300	.....	47,500
Western States Gas and Electric Company	109,000	7,080	4,650	20,000	.....
San Diego Consolidated Gas and Electric Company	77,000	.....	32,200	.....	.....
Snow Mountain Water and Power Company	48,000	6,400	.....	.....	.....
City of Pasadena	13,300	.....	7,000	.....	10,000
Ontario Power Company	10,200	1,700	.....	.....	.....
Utica Mining Company	9,700	2,275	.....	.....	.....
City and County of San Francisco	6,400	3,000	.....	80,000	.....
Melones Mining Company	4,900	800	.....	.....	.....
Coast Counties Gas and Electric Company	3,700	990	1,250	.....	.....
Coast Valleys Gas and Electric Company	60	.....	1,375	.....	.....
West Side Lumber Company	14	.....	700	.....	.....
Modesto Turlock Irrigation District	.....	15,000	.....	.....	.....
San Francisco Oakland Terminal Railway	.....	.....	6,500	.....	.....
Escondido Mutual Water Company	.....	600	.....	.....	.....
California Oregon Power Company	152,000	28,600	.....	3,300	.....
Mountain States Power Company	21,000	390	8,800	1,000	.....
City of Eugene	.....	1,800	.....	.....	.....
LOWER COLUMBIA GROUP					
Northwestern Electric Company	130,000	13,500	13,750	.....	.....
Pacific Power and Light Company	37,700	8,760	4,100	.....	.....
Portland Railway Light and Power Company	360,000	53,650	32,500	30,000	.....
UPPER COLUMBIA GROUP					
City of Seattle	110,000	26,500	35,000	35,000	.....
City of Tacoma	137,000	24,000	9,000	36,000	.....
Pacific Power and Light Company	45,300	12,280	3,575	.....	.....
Puget Sound Power and Light Company	560,000	89,000	28,500	16,000	.....
Stevens County Light and Power Company	No meter	1,200	.....	.....	.....
Washington Water Power Company	415,000	104,000	.....	19,000	.....
Grand Total	*7,080,274	1,323,055	550,050	410,100	127,500

*Not strictly additive as interchange power amounting to approximately 209,000,000 kw-hr. is included.

the costs of additions, betterments, and extensions to the company's properties, with the further restriction that additional bonds may be issued under the mortgage only when the total annual interest charges on all bonds outstanding are earned at least 1¾ times. Bonds are usually sold at a discount, that is, for less cash than their face value; and it is therefore evident that considerably less than 75 per cent of the funds required for the company's expanding business can be obtained from bonds, the remainder being necessarily obtained from junior securities.

Issuance of Preferred Stock

Practically all of the California utilities have outstanding preferred stock issues which have priority, both as to principal and dividends, over the common stock; in other words, it is necessary to pay preferred stock dividends in full before a dollar of dividends can be paid to the common stockholders, and in the event of liquidation, the preferred stockholder receives the full par value of his stock together (in the case of cumulative preferred stock) with accumulated dividends, before any disbursement whatever is made to common stockholders. As an additional safeguard for the preferred stockholder, some of the utilities have made their preferred stock non-assessable by the company. All common stock is assessable. These advantages naturally make it possible to obtain funds through the sale of preferred stock at a lower cost than from the sale of common stock, but in order to create a proper equity for the preferred stockholder, it is also essential to sell common stock.

Issuance of Common Stock

From what has been said, it is apparent that the issuance and sale of common stock is a desirable feature of any comprehensive financial plan extending over a period of years. The common stockholder is the shock-absorber in a corporation. He assumes the real risks of the enterprise. When earnings fall below normal, the common stockholder is the first to feel the effects of this condition, since the bondholder and the preferred stockholder are assured of their dividends before any disbursement is made to the common stockholder. On the other hand, his opportunities for profit are commensurately greater than in the case of the holders of senior securities, for the reason that the amount of dividends which may be paid him is not limited to a certain annual rate, as in general is the case of the holders of the other two classes of securities mentioned, but is limited only by the profits of the business and the policy of the management.

Why the Billion Dollars Will Be Forthcoming

This brief discussion of some of the elementary principles of corporate financing is intended merely as a very general outline of the machinery by which new capital may be secured. In order, however, to obtain the vast sums necessary to develop the West's hydroelectric resources, it is essential that the power companies must be able, in competition with the billions of dollars of corporate issues placed every year upon the money markets of the country, to offer attractive inducements to investors to attract the requisite funds. Fortunately for this region, the utilities are in a position to offer securities of sufficient attractiveness to insure their being able to obtain the desired new capital.

Capital invested in progressive and well-managed Pacific Coast power companies is unusually well secured. No new securities can be issued except under the authority of the State Railroad Commissions, which are recognized throughout the country as impartial and well-balanced regulatory bodies. Every dollar of new capital received is invested in plants or properties, subject to the supervision of the commission.

Public utility issues are generally recognized as the most stable class of investments in the market today, with the possible exception of government, state and municipal bonds, which yield a substantially smaller return to the investor. It is a fundamental feature of Pacific Coast electric utility operation that the gross earnings of the various companies continue to grow in spite of the periodic business depressions which sweep the country and which frequently have so adverse an effect upon a great many industrial issues. The war and readjustment period tested to the utmost the stability of public utilities.

The real strength of these securities lies in the fact that the power companies give an indispensable service in a progressive and rapidly growing section of the country; that they are generally conceded to be largely responsible for the tremendous strides made in the development of the state which they

TABLE No. V.

*OUTPUT IN KW-HR. PEAK IN KW. AND LOAD FACTOR FOR 1923
OF THE
PRINCIPAL PRIVATE UTILITY COMPANIES COMPRISING CALIFORNIA, SOUTHERN OREGON-INTERCONNECTED SYSTEM

	Gross kw-hr. delivered to System	Aver. kw.	#Peak in kw.	Load Factor (1922)
The California Oregon Power Company	152,051,781	17,400	Not available	.....
Great Western Power Company	575,283,500	65,700	107,000	61.7
Los Angeles Gas and Electric Corporation	126,691,871	14,500	44,000	33.4
Pacific Gas and Electric Company	1,725,619,492	197,000	306,945	64.2†
San Diego Consolidated Gas and Electric Company	77,911,600	8,900	20,400	43.7
San Joaquin Light and Power Corporation	465,260,480	53,100	70,000	75.9
Snow Mountain Water and Power Company	48,410,220	5,500	6,100	90.6
Southern California Edison Company	1,469,963,315	168,000	293,000	57.3
The Southern Sierras Power Company	206,478,200	23,600	Not available	.....
Western States Gas and Electric Company	109,323,960	12,500	19,400	64.3

*Includes purchased power. Interchange not deducted.
#Estimated on basis of average output and 1922 load factor
†1923 load factor—1922 output.

serve; that there is an almost unlimited field for their future expansion; and that the inhabitants of the Pacific Coast states are fully awake to the necessity of producing more and still more power to keep the wheels of progress moving.

One of the most encouraging things about the financing of these power companies is the unqualified support of the local investing public. Westerners believe in their hydroelectric utilities, and are not afraid to back their judgment with their money.

This widespread distribution of ownership among the utilities' consumers is significant not only as an assurance of the confidence and good will of the local public, but also as indicating to some degree its capacity and willingness to absorb hydroelectric securities.

It is, moreover, incontrovertible that as the West Coast grows in wealth and population, more and more of the securities of the local power corporations will be absorbed by her people, and this progressive "home-partnership" is an asset not lightly to be valued by investors, wherever situated, in considering the desirability of the offerings of these companies.

At the present time, when we have ceased to marvel at the engineering accomplishment in developing the power system which furnishes the Pacific Coast with energy at a cost which places it within the reach of all, it is difficult to realize the conditions that prevailed in this section thirty years ago; we are likely to overlook the basic quality of the commodity which was instrumental in bringing the far West states into the industrial field; we forget the financial and engineering difficulties and the efforts exerted by the men who visioned a scheme of general power supply.

In concluding this review we may say that the hydroelectric power system of the Pacific Coast is a dominating factor in commercial and domestic life. Its transmission lines have silently borne the energy which has made industry possible, and given vitality to the general growth. To a large extent it has brought about the development of the interior of the several states, and has largely influenced the regional prosperity. It has increased the taxable wealth many fold, and has put to use without impairment, natural water power resources which abound. In short, the part it plays in all phases of business and home life ranks it as a primary supporting element in the economic and social structure of the region.

Conventions and Their Byproducts

By Wm. A. Cyr

San Diego Consolidated Gas & Electric Company

CONVENTIONS are now quite a conventional occurrence. Summer is always open season for conferences, conclaves, regional meetings, Chautauquas or confabs, under whatever alias they may appear. A convention by any other name would be as sweet. And a presidential year gives us excellent cause—I was going to say excuse, but that is decidedly out of spirit with conventions—for a few extras not otherwise provided for in dry years.

There are yet existent a few of those rare old conventional people who do not believe in conventions. They, of course, have their reasons, but generally these reasons are only the false whiskers disguising two things. They've either never been to a convention, or have never been asked to one, and the result is the same.

For such rare cases, only a convention to devise means whereby more conventions can be held will solve the matter. And it is important that this be attended to at once. Only by such drastic means will these conservatives be proselyted to conventionalism and the cause saved. There is grave danger that, unless this be done, these earnest souls may destroy a truly great institution,—for in all sincerity it is a great institution.

In defense of conventions, conferences, and conclaves, if they need defense, let me bring the evidence of a "pro" to the discussion. Let me hold the brief for conventions—yes, even for the three great byproducts of conventions: golf, moisture, and song. (The latter is a cousin of humor, so let me include it with the others.) The editors being generous, my case shall not rest upon the verdict of the bar until conventions and their three byproducts have been nailed tight and clinched on the other side.

Conventions are a symbol of civilization. They would have been impossible in the days when every man was for himself. Meeting of two men on any ground of common interest is a sign of the laying down of weapons. If the first episode of this sort was over a skull full of wassail and this practice survives today, blessed be the wassail that brought them to some touch of brotherhood!

Conferences were impossible in early commercial and industrial life, for like social and governmental activities, they had to go through the fire of cut-throat competition, rapine and murder to evolve into some sense of balance. Society and government, older institutions, had already gone through these trials and emerged more or less purified. And industry, after its first exploratory adventures for new worlds, had to settle down to making something of those worlds it discovered or lose them. Everything fundamental, practically, having been discovered it is necessary to cultivate the garden, and neighborly good feeling has been found requisite lest the marauding chickens next door eat up all the seed each industry has planted.

Borrowing the convention idea from politics, industry and business have improved the model as

they are in the habit of doing with everything they touch, and have changed conventions so that now their own mothers would hardly know them.

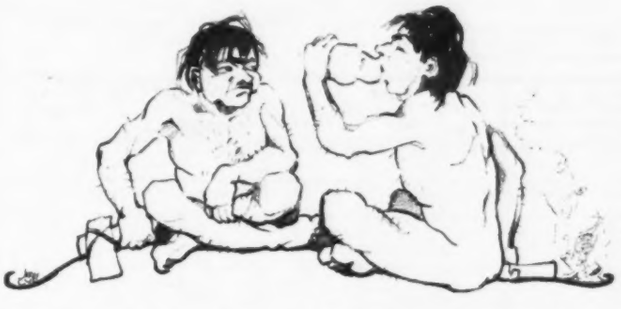
Political party conventions may possibly have serious purposes, I've really never been to one, delegate or otherwise. My impression is to the contrary. Conventions, in the hands of engineers and organizers on a grand scale, could hardly escape intensified organization. These men would not feel at home in a convention if it wasn't organized up to the last digit.

So the technical genius of engineers in the electrical industry has evolved from the convention something marvelous in its machinery. They have first given it a positive purpose, then set up the gears and gadgets necessary to make the purpose perform.

What is more spectacular, as a sheer piece of efficiency, than the intricate and wonderful organism of the technical section and its follow-the-leader, the commercial section? The model has been made and it works, and even that last outpost, the disorganized and didn't-care-if-it-wasn't-organized committee of newspaper men, the publicity section, has taken the pattern and cast itself one like it and is in process of becoming efficient. And it likes the idea immensely.

A convention, to the electrical industry, has evolved from being a mere gab-fest and Elks' picnic to something tremendously serious in purpose and sincere in accomplishment. It earns its 7 per cent dividends, just as stock does, because it is designed so that it will do so.

That 7 per cent dividend is the product of preferred stock. It is the meat of experience, of study, of experiment and research. It is the fruit of practice and it is passed freely at the table so that all may partake. If any representative has contracted



The first episode of this sort was over a skull full of wassail. It was a sign of the laying down of weapons.

a case of tummy-ache from some particular green apple, he is able to warn the boys and to keep them wary of that tree until the fruit ripens.

This all presupposes good fellowship. A convention and all its delicate mechanisms wouldn't survive ten minutes if fellowship, mutual interest and mutual helpfulness weren't the amperage, the voltage and the wattage energizing the whole proceeding. And to my humble opinion, if nothing else comes out of the convention sausage grinder, the laborer is worthy of his hire and a tip to boot.

This is my case. Whatever else I have in defense of conventions is in behalf of their triumphal triumvirate of byproducts, golf, moisture and song.

The first, a sport that only engineers could have found sportive, will find its defense in another article.

Moisture, too, in view of the water shortage and the sincere effort of conventions to comply with railroad commission rulings for conservation, is deserving of a commentary of its own.

A convention of Smiles was followed by a convention of dentists intent upon making the smiles more toothsome.

And song and humor, the mere fact that a convention of smiles at Coronado was followed the week after by a convention of dentists intent upon making the smiles more toothsome, is sufficient to warrant a concluding dissertation upon this all-important subject.

America Leads in Electric Brass Melting

IN the electric brass melting field, the United States has attained a tremendous lead over all foreign countries, according to a report just made public by the Department of the Interior, through the Bureau of Mines. Whereas in the United States there are about 540 active electric furnaces doing commercial non-ferrous melting, it is doubtful whether all foreign countries combined use 100 electric brass furnaces. Of the American furnaces, about 275 are induction furnaces, about 135 are moving indirect arc furnaces, 80 are Baily furnaces, while the remaining 50 furnaces are of various types.

The possibilities and limitations of the electric brass furnace are becoming better understood, the Bureau of Mines declares. The increase in the number of furnaces installed indicates that the growth is likely to continue, and that the electric furnace is of decided use to the non-ferrous metal industry. No radically new types of electric brass furnaces have been introduced in the United States in the last two years. The outstanding developments are the continued increase in the use of the induction and the rocking-arc types, and the lack of increase of less efficient types such as the granular-resistor and the muffled-arc types.

The COAST Outlet
ELECTRICAL CONSTRUCTIONISTS' and DEALERS' NEWS

Electrical Construction

By E. Earl Browne

IT will be noted in Fig. 13 of the Aug. 1 issue of the Journal of Electricity that each feeder, subfeeder, all motor circuits and all special lighting circuits such as signs, etc., are listed separately. In estimating such a job, the contractor should take only one circuit at a time and follow it through on the plans from start to finish by scaling off horizontal distances and adding verticals. Some estimate forms (see Fig. 14) have columns for the listing of elbows, bends and terminals and these items are counted and listed at the same time the length of run is taken from the plans.

and panel cabinet, two terminals at this cable support pull box, or a total of four.

In the case of a motor circuit there are always four or more terminals; one at the distribution center, two at the motor starter and one at the motor terminals. There is of course considerable difference in cost between a double lock nut and bushing terminal as at a cabinet, and an open terminal such as a condulet, and a motor terminal such as a piece of flexible metallic conduit with the necessary box connectors and each of these types should therefore be kept separate. In the installing of feeders and

Form 2

FEEDER SCHEDULE

ESTIMATE NO._____
SHEET NO._____
OF_____ SHEETS

JOB_____

ESTIMATED BY_____ DATE_____

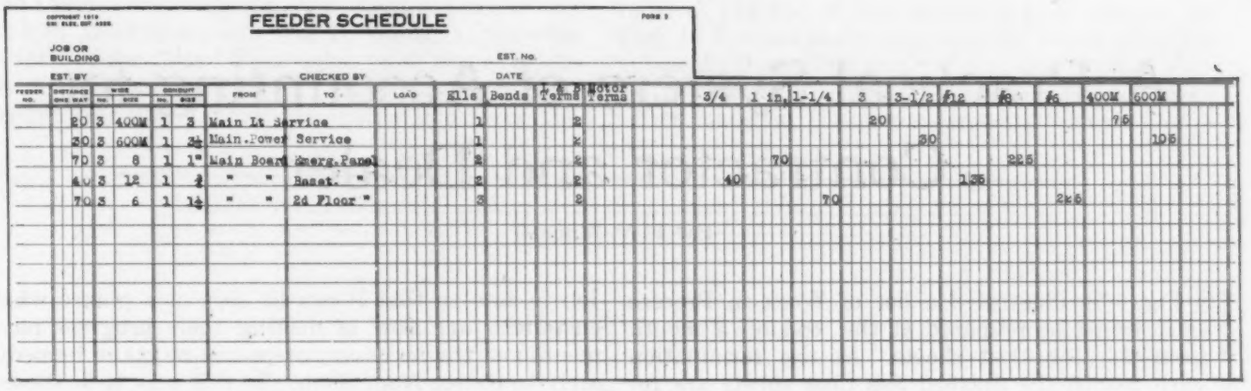
FEEDER No.		FROM	TO	CONDUIT—L & B					WIRE			Cond-ulet Terms	Motor Term	Pull Boxes
				SIZE	LENGTH	LS.	TERM.	BENDS	NO. WIRES	SIZE	LENGTH			

Fig. 14.

In figuring the number of terminals for the job, the contractor must bear in mind that a terminal is any termination of a run in either a cabinet, pull box or condulet. This means that where a pull box is installed in a riser as a cable support, in accordance with rule No. 26-o of the 1920 Code and rule No. 503-n of the 1923 Code, there would be included in addition to the terminals at the main switchboard

circuits exposed on ceiling or walls, the material to which they are to be attached should be noted as the difference in cost of labor and materials to install pipe straps or hangers on a wood joist as compared with brick, concrete or steel is a large item.

Figs. 15 and 16 show a feeder schedule sheet which is in some respects superior to both those shown in Figs. 13 and 14 in that it has a total of 16



FEEDER SCHEDULE

JOB OR BUILDING — EST. No.

EST. BY — CHECKED BY — DATE

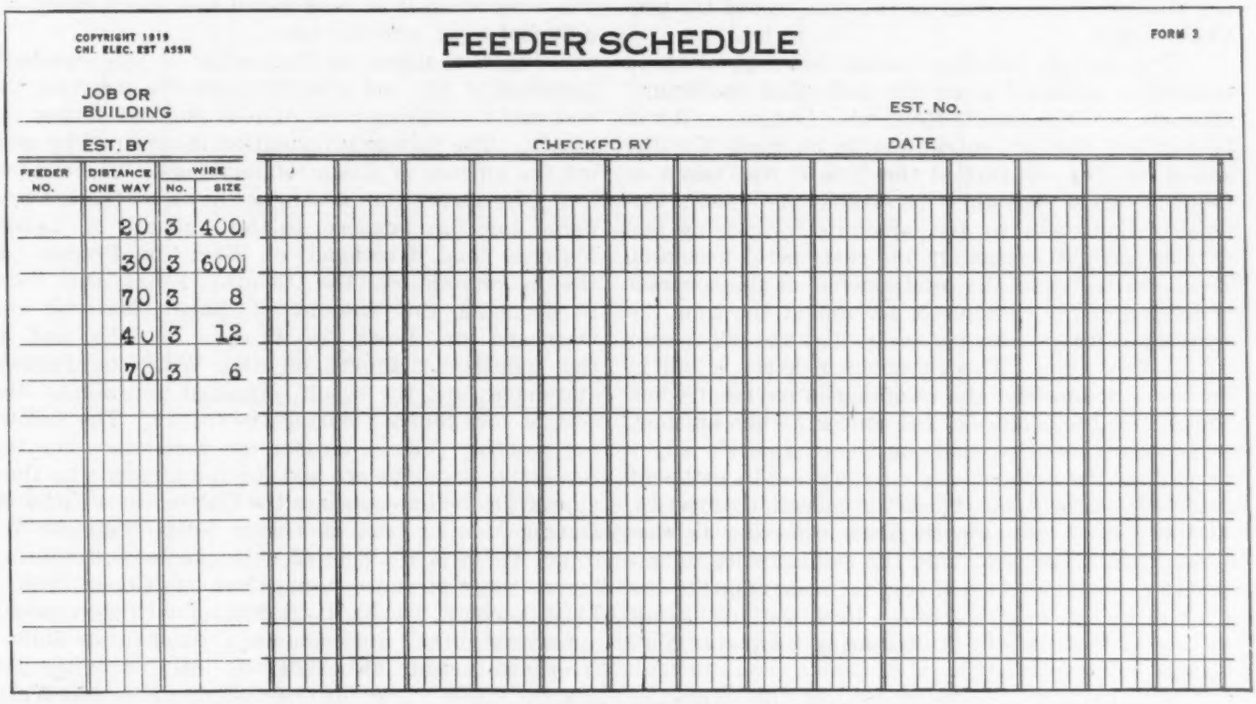
FEEDER NO.	DISTANCE ONE WAY	WIRE NO.	WIRE SIZE	CONDUIT NO.	CONDUIT SIZE	FROM	TO	LOAD	Ells	Bends	L & B Terms	Motor Terms		3/4	1 in.	1-1/4	3	3-1/2	#2	#3	#5	400M	600M	
	20	3	400M	1	3	Main Lt Service			1		2						20					75		
	30	3	600M	1	3½	Main Power Service			1		2							30					105	
	70	3	8	1	1"	Main Board	Emerg. Panel		2		2				70					225				
	40	3	12	1	¾	" "	Basst. "		2		2			40					135					
	70	3	6	1	1½	" "	2d Floor "		3		2					70					245			

Fig. 15.

blank columns on the front of the sheet and 14 on the rear in which to enter such items as are necessary to the job being figured and in addition is very convenient for special signal, fire alarm, telephone and other systems where various combinations of wires are used.

In using the feeder schedule sheet shown in Fig. 15, the contractor fills in the eight columns at the left with the necessary information so that in using the sheet he has before him the distance the feeder is to run, the number and size of wire and conduit together with a statement as to what points the feeder is to connect. The ninth column provides space for the estimator to indicate the load that the feeder is to carry. The sixteen columns at the right of the load column are intended to be used for the listing of various feeders, ells, bends, L & B terminals, motor terminals, etc. The estimator can head the columns in any way that he sees fit, the purpose of the sheet being only to give him a means of checking to make sure that he has not omitted anything from his cost sheet.

As may be seen in Fig. 15, adequate space is provided for the listing of sixteen different items. Should the estimator find that he needs more than this number of columns to list his feeder runs, it is only necessary for him to fold the sheet (Fig. 15) over half way so that the right hand back half folds over and forms the right hand front side as is shown in Fig. 16. In this way fourteen more columns are placed at the estimator's disposal. The cross rules on this half of the sheet are exactly in line with those on the face of the schedule and it is unnecessary for the person using the sheet to rewrite the information originally placed in the first columns. The use of this sheet simplifies the work and saves considerable time in making out the estimate for the job.



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FEEDER SCHEDULE

FORM 3

JOB OR BUILDING — EST. No.

EST. BY — CHECKED BY — DATE

FEEDER NO.	DISTANCE ONE WAY	WIRE NO.	WIRE SIZE
	20	3	400
	30	3	600
	70	3	8
	40	3	12
	70	3	6

Fig. 16.

A Practical System of Accounting for Contractor and Dealer

By F. V. Mitchell

IN Fig. 1 is illustrated a list of Work in Process as it would be prepared at the end of a month from the Job Cost sheets. At the termination of each month the finished Job Cost sheets are removed from the active lot and placed into another binder provided for that purpose. The list of Work in Process is then prepared in accordance with the illustration from the totals of labor and material to date as shown upon the Job Cost sheets remaining in the active binder. The overhead on Jobs in Process is obtained by adding the amount of overhead on unfinished jobs that appears on the list of labor and material put into jobs during the month to the amount of overhead on the same jobs as shown on job to date so that it can be seen at a glance what customers are slow in making their progress payments and the necessary steps can be taken immediately to collect from them. In this way it is shown very clearly how much the electrical contractor has tied up in a job at the end of any month during its progress by noting the amount appearing in the Total Labor and Material column, less the amount collected from the customer appearing in the Received on Account column. Jobs being performed on labor and material basis that may appear in process at the end of a month would not carry a selling price, as the amount of these for billing purposes naturally cannot be obtained until the completion of

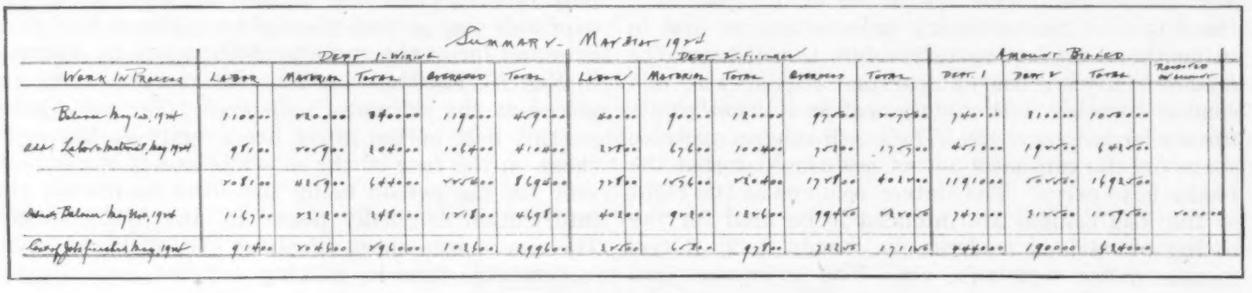


Fig. 2.

the Work in Process statement at the end of the previous month.

The amount billed or selling price on work in process is obtained from the individual customers' accounts in the Accounts Receivable Ledger, as it will be recalled that an entry was to be made for the amount of the contract at the time it was taken as follows: debit Accounts Receivable and credit Unfinished Contracts to the amounts for wiring and fixtures posted separately on customers' accounts. The mere fact that the total amount of the contract is debited to the customer's account at the time the contract is taken, does not mean that the bill is sent out at that time. The customer receives a bill in the usual manner for the roughing-in payment when due and for the balance of the contract when finished. A notation should be made on the customer's ledger account of the amount due on roughing-in payment and of the date he was billed for collection purposes. At the end of each month when referring to customers' ledger accounts for the selling price of unfinished jobs, a notation should be made opposite the amount on the ledger account that the job is not finished at that date in the following manner: "N.F. 5-31-24."

A column is also provided on the Work in Process form to show the amount collected on a the work when it is ascertained how much labor and material went into the jobs.

Fig. 2 contains an illustration of the Summary prepared at the end of each month to ascertain the cost and the selling price of jobs finished during the month. The former information is obtained by adding the amount of Labor, Material and Overhead put into jobs during the month, as shown on the list prepared for that purpose, to the amount of Labor, Material and Overhead on Work in Process at the beginning of the month. From this total is deducted the amount of Labor, Material and Overhead on Work in Process at the end of the month as shown on the Work in Process statement, and the result obtained represents the cost of jobs finished during the month. The following monthly journal entries are then made for the respective departments and for the amounts as they appear on the line opposite the Cost of Jobs Finished During Month; Cost of Goods Sold—Material Account No. 52 A—is debited with the amount appearing in the Material column, Cost of Goods Sold—Labor account, No. 52 B—is debited with the amount appearing in the Labor column; Cost of Goods Sold—Overhead account, No. 52 C—is debited with the amount appearing in the Overhead column, and Work in Process account No. 15 is credited with the total

of all three above amounts. The debit balance of the Work in Process account No. 15 should agree with the total of the Grand Total columns of Departments Nos. 1 and 2 on the Work in Process statement, and is a concrete proof that the entire work for the month has been handled correctly through the Work in Process account.

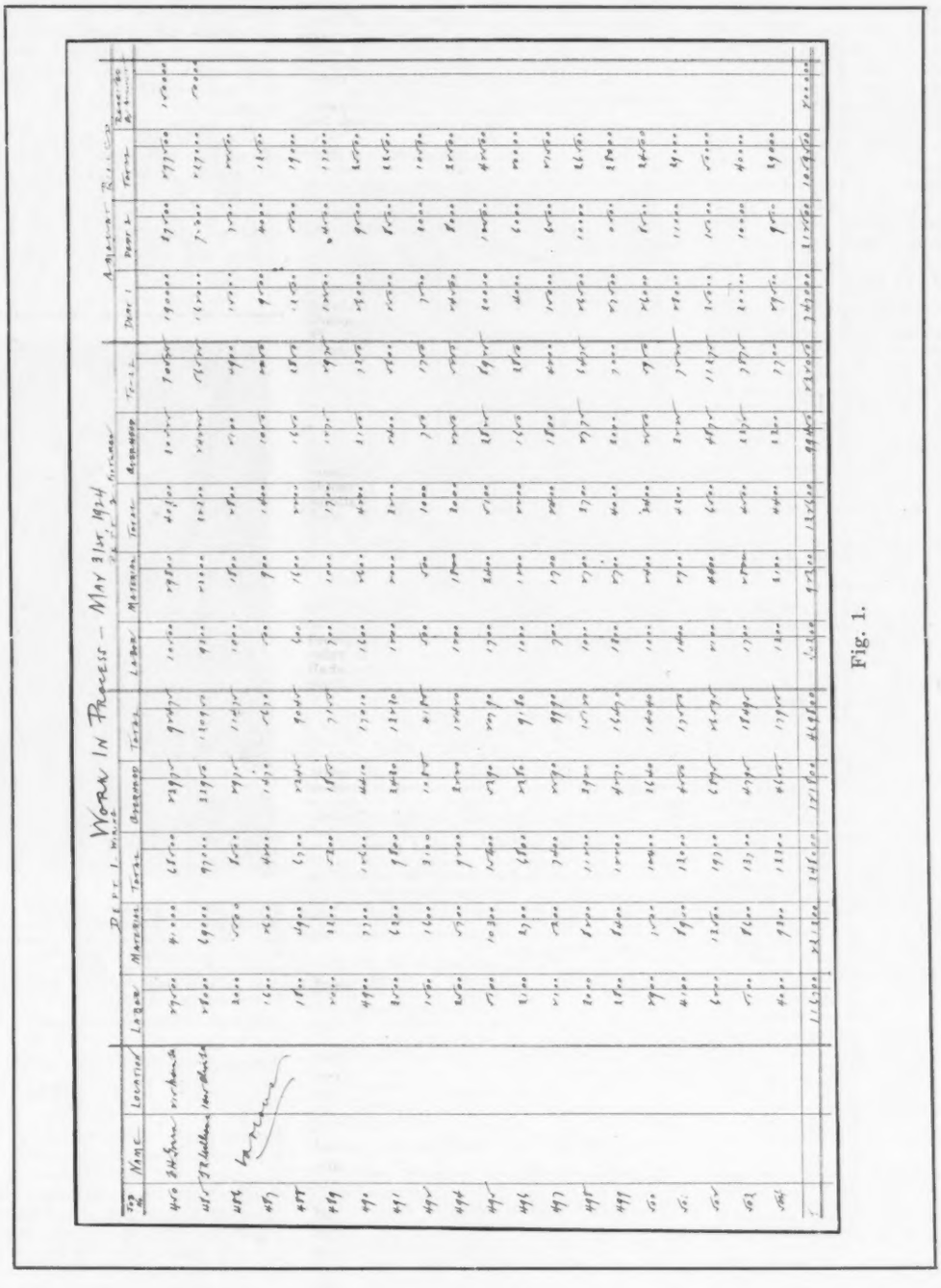


Fig. 1.

The information as to the selling price of the jobs finished during the month is obtained by adding the total amount of contracts (or jobs) charged to Accounts Receivable (and credited to Unfinished Contracts) during the month, to the balance of Unfinished Contracts on the first of the month. From this total is deducted the amount of Unfinished Contracts at the end of the month as is shown on the Work in Process statement, and the result obtained represents the selling price of the jobs finished during the month. The following monthly journal entry is then made for the respective departments: Unfinished Contracts account No. 16 is debited and Sales account No. 50 is credited with the amounts appearing on the last line of Summary under Amount Billed. The credit balance of Unfinished Contracts account No. 16 should agree with the total of the Total Amount Billed column on the Work in Process statement and is a definite proof that the entire work for the month has been handled correctly through the Unfinished Contracts account.

Changes in Electrical Code at Oakland, Calif.

Conduit Requirements Greatly Increased and Redistricting Made Necessary by Ordinance Effective October 1, 1924

The City of Oakland, Calif., has joined the ranks of those municipalities that have recently increased the required use of conduit and have otherwise strengthened the installation requirements. In the case of Oakland this has been done under the guidance of Carl E. Hardy, superintendent of the electrical department, and Ben C. Hill, supervising inspector, both of whom have given the matter exhaustive attention for a long period of time. The entire city has been redistricted and the use of conduit has been made compulsory over a much greater area than heretofore. The new ordinance requirements are given herewith and become effective on Oct. 1, 1924.

Section 28c. All electrical work and equipment shall comply with the requirements of the National Electrical Code of the National Board of Fire Underwriters, as supplemented, amended, and interpreted by the rules and regulations hereinbefore provided for in Section 28a.

Section 28d. When there are obtainable for any given purpose materials, fittings, devices, or appliances that have been examined by a properly qualified and authorized body and approved, listed, or labeled as conforming to the standards of the Underwriters' Laboratories, the United States Bureau of Standards, or other similar institution of recognized standing, then such materials, fittings, devices, or appliances shall be used in preference to others which have not been so examined and approved, listed, or labeled. The use of all materials, fittings, devices, and appliances shall in all cases be subject to the rules and regulations hereunder established.

Section 28e. For the purposes of Section 28f to 28n, inclusive, the following definitions shall apply. "Frame building" means a frame building as defined and intended in the Building Law of the City of Oakland. "Dwelling," "apartment house," and "hotel" means a dwelling, apartment house, or hotel as defined in the State Housing Act. The terms "wiring" and "electric wiring" mean and include all fixed wiring for light, heat, or power purposes and all fixed wiring for other purposes which is in direct electrical connection with any light, heat, or power circuit, excepting wiring in or on a power station or substation controlled and operated by, and located on the premises of, a power company or railway company.

Section 28f. All electric wiring hereafter installed in any building shall be installed in approved metal conduit, armored cable, or metal raceway; provided, however, that concealed knob and tube wiring may be installed in any buildings used or intended to be used only as dwellings, or in frame buildings used or arranged to be used in part as dwellings and in part for business purposes and containing not more than two stories and basement, or in other frame buildings containing not more than two stories and basement.

Section 28g. Anything to the contrary herein notwithstanding, all service wiring in or on any building shall be installed in approved rigid metal conduit or approved lead-covered and steel-armored cable; provided, that the Superintendent of the Electrical Department may permit the installation of concealed knob and tube service wiring in single-family frame dwellings.

Section 28h. Service outlets for overhead services shall be located at least 18 ft. above ground, height of building permitting, and shall be at or within one foot of extreme end of building nearest the overhead supply line and in such position that service drops may be attached within approximately 18 inches thereof and maintain required clearances. All service conduit and conduit fittings installed on the exterior of any building shall be galvanized or sherardized. All services operating at more than 600 volts shall be run underground from supply line to building, except buildings used only as power stations or substations of power companies and railway companies.

Section 28i. No wiring shall be installed in wooden molding or wooden raceway, except by permission of the Electrical Department when making minor changes in or additions to existing installations. No open wiring shall be installed in or on buildings except when and as authorized by the Superintendent of the Electrical Department. Anything to the contrary herein notwithstanding, concealed knob and tube wiring shall not be installed in any case with conductors larger than No. 8 Brown and Sharpe Gage or when the voltage between any two wires of the circuit will exceed 300 volts.

Section 28j. Anything to the contrary herein notwithstanding, all wiring for motors rated at one horsepower or more shall be installed in approved metal conduit, armored cable, or metal raceway, and all wiring in unceiled or unfinished basements, cellars, and spaces under buildings shall be installed in approved metal conduit or armored cable excepting in buildings where knob and tube wiring is permitted, short runs leading from meter cabinet to wall above when such runs are not located where exposed to liability of mechanical injury.

Section 28k. In new installations, not more than two sub-feeder or branch circuit cutouts shall be installed on the load side of any meter in any meter cabinet opening to the exterior of a building. For a larger number of cutouts, distribution center shall be provided at suitable location within the building.

Section 28l. Electricity or gas shall be used for the lights installed in apartment houses and hotels to comply with Section 66 of the State Housing Act, provided electricity or gas is available in the building.

Section 28m. Whenever any dwelling or apartment house hereafter constructed is wired for electric lighting, and whenever any existing building is hereafter converted into an apartment house and wired for electric lighting, an approved concealed contact type plug receptacle shall be installed in each living room, parlor, dining room, and kitchen; provided, however, that this shall not apply to dwellings costing less than $1,200.00, as evidenced by the building permit. If any such receptacle in a kitchen, dining room, bath room, laundry, breakfast room, or breakfast nook is connected to a branch lighting circuit, no additional plug receptacle shall be connected to such lighting circuit. So far as is reasonably practicable, all manually operated switches shall be of the safety type and all panel boards and substitutes therefor shall be of the protected type.

Section 28n. No transformer operating at more than 600 volts shall be installed on the roof of any building (other than power stations and substations) unless installed in a transformer vault constructed in substantial compliance with the requirements of the National Electrical Code. No such transformer vault shall be constructed on the roof of any building until the Building Inspector shall have approved the structure of the building as being of sufficient strength to carry the additional weight of such vault and the equipment contained therein.

Section 28o. The requirements prescribed in Sections 28b to 28n, inclusive, shall be deemed the minimum requirements upon which the rules and regulations hereinbefore provided for shall be based, but shall not be deemed to constitute complete requirements in respect to the safety of electrical work and equipment as required by Section 28a hereof. The Superintendent of the Electrical Department may, for good cause or when the public interest may require, permit deviation from the requirements of Sections 28c, 28d, 28f, 28g and 28h.

Section 28p. The Superintendent of the Electrical Department is hereby authorized and empowered to furnish copies of the rules and regulations provided for in Section 28a to persons performing or having supervision of electrical work in the City of Oakland.

SECTION 2. This Ordinance shall take effect October 1, 1924.

Laurence W. Davis Visits Coast and Makes Addresses

Laurence W. Davis, general manager of the Association of Electragists, International, visited the Pacific Coast during the early part of August and spent some time in San Francisco, Oakland and Los Angeles, Calif. Mr. Davis addressed several contractor-dealer meetings at all of these points and told of the work of the association. He also pointed out some of the facts most necessary to the success of the contractor-dealer, many of which are very often overlooked.

At a meeting held in Oakland on Aug. 6, under the auspices of the Electrical Contractors' and Dealers' Association of Alameda County, before an audience of about eighty-five members of the industry, Mr. Davis spoke on "Practical Problems of the Electrical Contractor-Dealer." Illustrating his talk with figures taken from actual operating conditions and using blackboard and chalk, Mr. Davis drove home the need for accurate accounting and for the due consideration of the item of overhead. He also made comparison between large and small firms, showing that it is easily possible for a small concern, by due attention to its cost of doing business, to make a greater net return for the year than a larger company that fails to recognize the importance of this factor.

On Thursday, Aug. 7, Mr. Davis addressed a luncheon meeting of the San Francisco Electrical Contractors' Association. At this time he spoke of the work of the Association of Electragists, International, and of the constructive effort the association is putting forth for the benefit of contractor-dealers.

Fred LaPlace, resident manager of the Sacramento, Calif., branch of the Thomas Day Company, began his career in the electrical industry in 1906 in the fixture department of the Albert Sechrist Company in Denver. He became resident manager of the Sacramento branch when it was opened in 1922.

Annual Convention to Be Held at Santa Cruz, Sept. 19-21

The annual convention of the California State Association of Electrical Contractors and Dealers will be held at the Casa del Rey Hotel, Santa Cruz, Calif., Sept. 19-21, inclusive. A program filled with live topics and events will be presented and a record attendance is already assured. Walter F. Price, executive secretary of the association, has charge of the arrangements, both of the program and for hotel accommodations. Special arrangements have been made with the hotel for superior accommodations and special convention rates in order that members may, if they desire, be accompanied by their families. There will be games and other entertainment for the children and numerous sports events have been arranged for the ladies. Full announcement of details of the convention will appear in the Sept. 1 issue of the Journal of Electricity.

A Word to the Wise Beats a Bob-Tailed Flush—in Dry Times

Every once in a while Old Man Grouch gets on the job and violently attacks some of us at an unsuspecting moment. When this happens there generally ensues a period of deep "peeve" during which we feel that the whole world is wrong and that there is no hope.

For the benefit of those who are now suffering from such an attack or who may in the future feel the symptoms approaching, the following letter may serve as an antidote to the poison of pessimism. This letter was recently sent out by Laurence R. Chilcote, secretary-manager of the Electrical Contractors' and Dealers' Association of Alameda County, to the members of the association. Mr. Chilcote spent some time gathering the facts and figures used in his letter and collected the information from authentic sources. The figures given prove beyond doubt that any so-called "depression," insofar as the western portion of the country is concerned, exists only in the mind of the pessimist. Mr. Chilcote said:

Reach for the Knocker who says **"Business is dropping off"** and explains it as due to the Presidential year, or because it has been a **dry** year, or because of the "hoof 'n mouth"—or anything else.

Reach for him—and drop him off—because otherwise he will be the cause of business dropping off. Broadcasting the **misinformation** that things are getting quiet will discourage others **about** to transact some business, and then these others will put their cold feet against the backs of others, and finally some banker will advise **everybody** to slow up—**then**—we sure will have a crisis!

Times never were better.

July building permits for Oakland totaled $3,350,532, or within $30,0000 of the high mark, set way back in June, 1922. This is the second time in history that construction has gone over 3 million.

Electrical permits for the 7 months of 1924 total 7,296, which is 9 per cent increase over the 6,753 permits for the same period of 1923, and 36 per cent increase over the 5,371 permits for the same period of 1922, or 88 per cent increase over the 3,867 permits for the same period of 1921, which is 155 permits more than were issued during the whole year of 1921, or compare them with the 5,673 permits for the whole year of 1920.

The beet sugar yield is 20 per cent higher than last year and represents 16 million dollars gross.

More cars of oranges and lemons were shipped this year than last.

Fifteen per cent more cars of cherries were shipped this year than during 1923.

Grape outlook is excellent and, although the prune and apricot yield will only be 80 per cent of last year, still it will bring **more dollars** than last year.

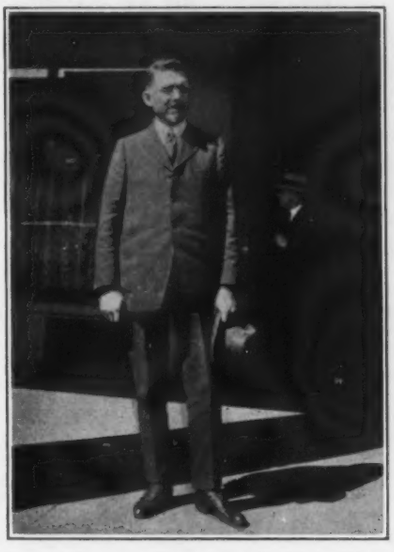
San Francisco conditions affect the entire Bay territory, so let us look there, where building permits for the 7 months were over 30 million, or 10 per cent increase over 1923—the post office receipts for the period were over 4½ million or 20 per cent increase over 1923—bank clearings for July were the highest in history, and export trade is three times as much as the average for the 5-year pre-war period.

Savings deposits for Oakland increased 6.4 per cent, and for San Francisco increased 9.1 per cent over 1923.

Don't judge the peach by the taste of the lemon. Simply because **you** didn't get the last couple of jobs you estimated, or because **you** haven't enough work to keep **all** the men in Oakland busy, is no sign that business has gone to the place where you will shortly go.

Optimism—think it, talk it, act it.

Let's make **every year Presidential** and **dry**!



J. G. Cravath, electrical engineer and president of the Pioneer Electric Company, Richmond, Calif., is one of the leaders in the promotion of better home lighting.

China Boss Writes Power Co. "Him Copy Meter Wrong"

The following letter from a member of the Chinese colony of Sacramento, Calif., was received by the Great Western Power Company:

10th May 1924
Present

H. S. Rush,
Sacramento, Calif.
Sir:

Your kind letter received in the same date, soliciting me why it is that we used electric current to the extent during March for the sum is $4.45 whereas for February it is only $1.25.

I beg to tell you the reason why we used in March so extensive, because I can scarcely remembered the meter man always come to copy our meter not fix in the end of every months.

Sometimes they come before twenty days soon, and afterwards that ten days come over again. So that the amount one month will make more, and the another month will make more less. (Sometimes no come.)

At the beginning we got light in the China Camp, I can remembered only used about $2.00 Sometimes in each month.

You can easily understand we only used one point in my sitting place, and sometimes open the middle one in the use time, the rest is all stop. When our sleep is all shut. How can we used double prices.

If we do this more expenses, and you ought to be punish us. While I dare not to do it.

In this case, not you asked me this surprise question, on the other hand, I asked myself so wonderful.

Now I cannot describe you no more but you can ask the Great Western Power Co.'s man, perhaps they copy the wrong points in the meter.

Yours faithfully,
YET LEE TONG,
China Boss.

P.S. I asked the neighbor he says sometimes 50 days no copy the meter and the amount always some more or less in all time.

Lightning Arrester Grounds Is Subject of Publication

A comprehensive publication entitled "Lightning Arrester Grounds" is being distributed by the General Electric Company. The material in this pamphlet is an elaboration of a paper by H. M. Towne, presented before the Southeastern Division of the N.E.L.A. at Tampa, Fla., Nov. 20, 1923, and since published in Electrical World.

The pamphlet includes a total of 18 pages, plentifully illustrated with photographs, charts, diagrams and tables. The subjects covered include the following topics: Ground Electrodes; Components of Ground Resistance; Preliminary Survey of Soil; Effect of Moisture; Effect of Temperature; Seasonal Variation; Effect of Depth; Size of Electrode; Suggestions on Driving Ground Pipes; Connecting Ground Wire to the Pipe; Multiple Ground Electrodes; Artificial Treatment of Soil; Energy Dissipation of Ground Connection; Pole Type Installations; Secondary Grounds Isolated; Common Neutral Ground Wire Distribution System; Station Arrester Grounds; Overcoming Adverse Conditions in Grounding; Railway Arrester Grounds; Inspection; Resistance Measurements, and a summary.

Accounting Problem Questions Answered by Expert

The Journal of Electricity has made arrangements with F. V. Mitchell, public accountant of San Francisco, to answer, in these columns, such questions as may be asked on accounting. All readers are invited to forward their inquiries to The Editors, Journal of Electricity. The answers will be published as soon as possible following the receipt of the inquiry.

Question:
How is the average ratio of material to labor running now on jobs and what should it be?

Answer:
The average ratio of material to labor is running very close to one-and-one, is running very close to one-to-one, It can be readily seen from this that the labor on jobs is running much higher than it should.

Report on Radio Batteries Published.—"The Standardization of Tests for Dry Cells Used in Radio Receiving Sets" is the title of a report recently published by the American Electrochemical Society.

JOBBER, DEALER AND SALES AGENT

Getting the Electrical Story in the Local Paper

Contractor-Dealers Can Present Much Material by Adding a Touch of Local Interest to Suggested Articles

By ROBERT S. MERRILL

Local newspapers, outside the very largest cities, will print in many cases good local stories that promote an interest in electrical merchandising. Here is an example of what one newspaper man from Oregon suggested to city editors all over the country through the "hunches" department—an exchange of experiences—in the Editor and Publisher, a newspaper trade paper:

"Electricity in your town—what does it do besides light the city and operate the toasters on your breakfast tables? Hunt up interesting electrically operated things—the polisher in your shoe repair shop; bakers' and doctors' contrivances and other applications of electricity. What does electricity do on wash day? On cleaning day? How does it save steps down town? How does it contribute to pleasure and education? Your power and light company will be only too glad to help you with suggestions, but don't go to seed on household appliances. Be chatty and clever—don't sound like an advertisement. Stick to local stuff and don't be afraid to use names of firms and persons now and then."

Another interesting suggestion was made by a newspaper woman from Liberty, Mo.:

"A story that will be read with much interest by all owners of any electrical appliance can be secured without much effort from your local electric light office or your meter man. Find out how many electric ranges are owned by the women of your town and the average cost of electricity per month. You will find that where there are servants or any help in the home the amount of 'juice' used will mount up much more. When I wrote a story about Liberty there were over 175 ranges in use so it made a good story. You can interview several of the women who have used the ranges for years and see if their good opinions have decreased or increased with the years of use."

From the fact that the newspapers themselves seem to be taking the initiative, it is apparent that this article is not an attempt to urge electrical dealers and contractors to try for a large amount of free publicity. It is merely pointing out a tendency on the part of newspapers with which men in the electrical trade can connect. Stories like those suggested would not be run nor would the suggestion be passed on if they were not believed to be "good stuff."

One of the reasons why it is good stuff may be found in the last sentence of the first suggestion, "Stick to local stuff and don't be afraid to use names of firms and persons now and then." That is what the readers of newspapers in a less-than-a-metropolis want. The fact that Mrs. Jones has a wired tea-cart means more to her than any general article on the use of electricity.

Nearly all of the newspapers have plenty of available material upon uses of electricity. Even if certain organizations don't supply it to them, the syndicate services to which the newspapers subscribe, send articles regularly written by women, but all of these articles must be written in a general way to apply to conditions everywhere and lack the local effect. That is why you find newspaper men suggesting to one another some interesting ways of covering a subject that is of interest to women readers. And above all, the newspapers cater to the women readers. They buy their syndicate features, comics, household hints, and fiction with the idea of making women regular readers of the paper.

This local element is one thing that has made the many electric homes throughout the country a success. Women reading about these homes are conscious that it is something in their immediate territory—that it is something likely to affect the method of living in their neighborhood and therefore they will want to inform themselves.

Now it has been shown that some newspapers have an interest in electrical subjects as they affect the readers in their particular communities. However, there are not the channels of contact between electrical men and newspapers which would bring out the best material. If competent newspapermen or newspaperwomen and electrical dealers or contractors were sufficiently acquainted, a wealth of interesting material about things electrical would be uncovered and printed.

But in most communities, the electrical store is not covered by the newspaper. Contrary to common belief, newspaper reporters do not go hither and thither seeking news. Most of them are assigned to regular "beats." The development of the electrical field has been so rapid that it has not been assigned a place on any of these "beats."

Anyway, few stories would be uncovered in the routine matter of visiting electrical stores. Few electrical dealers or jobbers know what interests the newspapers. The best stories come from friendly convensations. Let an earnest electrical dealer conduct an ordinary conversation of half an hour with a newspaper reporter, who is good at human interest feature stories, and it is likely one or more topics for "time copy" articles will be uncovered. "Time copy" articles are those that do not have to be rushed into print but can be set in type when the compositors are less rushed and used any time to fill up pages that are sent to the plate makers early in the morning or evening. In short, if live electrical men and live newspaper reporters can become friendly both will benefit.

If an electrical dealer or contractor has something that is clearly of news value, he can telephone it or write it out and send it to the newspaper. Don't ask to have a reporter sent to see you. If there is more wanted, the city editor will send a reporter to see you. Many reporters are literally worked to death and dislike to act as messenger boys for material that could be written out. Nevertheless, the paper will remember you as being friendly and when somebody gets a hunch as suggested in the beginning of this article, you are liable to be called upon first of all. It is the policy of newspapers outside the large cities to take care of their friends, not in the sense of hushing up news, but in mentioning them when it can be done legitimately.

Another avenue of contact was suggested by a newspaper man in the Editor and Publisher:

"No one is more critical of a technical error in a newspaper than a professional man, especially when the error relates to his own profession. Realizing this, one newspaper has arranged with an electrical engineer, physician, attorney, and a dentist, to call them when there is the least doubt in the editor's mind as to the correctness of a technical term used in the story. He calls them his 'advisory board' and they donate their service for the satisfaction of seeing the terms used correctly."

Sometimes contact can be made through meeting reporters at meetings of electrical organizations. For instance, in February the Dallas Electric Club, at a luncheon, had an address on the "Primeval Days of Electricity in Dallas."

This idea of contrast between former and present times is always a good newspaper angle. The papers like to use it in "local stuff," and who, beside the electrical dealer or contractor, can tip them off to "local stuff"?

By using a truck the Ohio Brass Company is able to display line hardware to men on the job without causing them any inconvenience.

Traveling Display Takes Equipment to Field Men

Ohio Brass Company Truck on Educational Tour Permits Men on Job to See Company's Line of Hardware

An unique advertising scheme for the exploitation of the mining, street railway, and transmission line hardware products of the Ohio Brass Company was seen recently in California in the form of a specially designed truck, which has been carrying a display of these goods through the Western territory since October. The truck is in charge of C. H. Burkhalter, commercial engineer for the company at Marshfield, Ohio, who states that it has been on the road for over four years.

As it is shown in the accompanying illustration, the truck contains display cases with drop doors along either side. The various samples are stapled to the walls and doors of these compartments to allow easy inspection. The interior compartment contains the larger pieces of equipment including an electric welding machine.

The campaign is mainly to educate rather than to sell directly, though Mr. Burkhalter is accompanied on successive stages of his route by the company salesman assigned to that particular territory. The salesman, by his familiarity with his own territory, expedites the movement of the truck and sees to it that present customers are visited. The unique feature of the plan is that the truck calls on the men in the field rather than on home offices. Mining camps, line construction camps, and working crews in all lines of work to be appealed to, are visited and shown on the ground the materials the company has to offer, with the idea of demonstrating the goods to the men who actually use them and to receive their suggestions as to the efficacy of these goods. The educational feature of the plan, therefore, works both ways, since the company not only acquaints the trade with its products, but also receives ideas which can be used to improve them.

The company claims that this scheme has produced excellent results in securing publicity, making good will, improving its products, and building business.

Following the trip through California the truck proceeded to the Northwest, visiting railway and mining companies en route. The general procedure was to bring the truck to a place where construction crews could easily reach it. In many cases foremen have taken their men from jobs in order that all of them might get a chance to see the equipment.

KEEPING CASH CUSTOMERS vs. WINNING AN ARGUMENT

By JOE OSIER

If it is a fair question, and I think it is, what do you do about the complaints that daily trickle into your office about faulty merchandise, questionable workmanship, discourteous employees, and the like?

Do you ignore them, setting them aside as trifles, or do you go about making things right, adjusting, explaining, mollifying, thereby holding your trade and making friends for your business?

Some firms—there are too many of them—flatly deny all charges made; they win the argument but lose the customers—but—

The wise hombre, the one who will stay in business and prosper, denies nothing, argues not at all and concedes until the irate purchaser or client is willing to play fair and go 50-50 on the concession business.

It is nice to win an argument, I'll admit, but were I keeping a flock of employees out of the ranks of the workless ones, the while going round and round with ol' John Overhead, I would make concessions and friends rather than out-shout and out-talk persons who have it in their power to make me wealthy and famous.

A certain contractor-dealer in my town, who has made a conspicuous success of his business, never lets a complaint go by as inconsequential. To him every murmur of dissatisfaction is a matter of importance; every complaint represents evidence that his service and his merchandise are not as good as they might be and he takes steps immediately to determine the why and the wherefore—

Consequently, he is as welcome in any bank in town as a barrel of apples in an orphan asylum.

His credit and friends are unlimited—his organization functions as smoothly as an eel in a vat of lard and his volume is increasing so rapidly, he has never been able to definitely locate the peak and—

The End of a Perfect Argument.

He swears he has never won an argument in his life.

Of course, this policy and effort in connection with complaints is only one phase of a very broad and intelligent program of developing business but, primarily, this man has succeeded because he has always done the right thing, in the right way at the right time, and he has builded far better than he ever realized was possible.

There are many bad turns, dangerous intersections and congested crossings in business, but all these can be negotiated provided the real business man knows where he is going and proceeds with steady hands at the wheel and eyes open—

Looking out for a public which is ever quick to carp and criticise but which as easily forgives and forgets.

And so I say, The business man who plays to the public; who caters to its caprices; who admits he is wrong (when admitting so involves nothing greater than the loss of an argument), is the one who will answer "Here" when the roll of successful Men of the Trade is called.

INDUSTRIAL NEWS

Rescind Order Granting Increase to Edison Company

Two orders, the first of which granted the Southern California Edison Company a ten per cent emergency increase in all light and power schedules, with the exception of agricultural rates, whereas the second rescinded this order and reopened the case, have been issued by the California Railroad Commission in less than a week. The first order, granting the increase for a period of eight months, was issued Aug. 1 and was to become effective Sept. 1. On Aug. 6 Clyde L. Seavey, president of the commission, and Commissioner Egerton Shore filed a dissenting opinion and following this on Aug. 7 notice was issued that the case had been reopened and that a hearing would be conducted on Aug. 23. The rehearing was scheduled to be held before Commissioners Seavey and Whittlesey in Los Angeles.

In the original order the commission found the increase necessary because of the abnormal expense involved in the production of power resulting from the water shortage in southern California. The decision stated that the Edison company had been forced to manufacture and purchase steam generated power at greatly increased cost. In applying for the temporary increase the company contended that it would suffer a loss of $5,600,000 in net revenues and asked the commission for an increase to produce additional revenue amounting to $3,000,000. The commission did not allow this claim, but cut the increase to add approximately $1,100,000.

The dissenting opinion of Commissioners Seavey and Shore is based upon the following five points:

The principle of basing rates upon average conditions over a period of years rather than upon special conditions of any particular year.

The unsoundness of granting emergency rates in the face of the company's present ability to pay eight per cent dividends on its common stock.

The injustice of imposing upon the company's consumers, the cities, industries and other public utilities dependent upon this company for their electric light and power, the extra burden of sharing the company's temporary losses in addition to the hardships and losses which they themselves are enduring from the same causes.

The incompleteness of the record in the proceeding, which did not include any report of check made by the commission's engineers.

The failure of the majority decision to take into account the accumulated surplus of the company, which, according to the dissenting commissioners' opinion, together with the contingency reserve and the estimated net revenue for the year, enable the company to meet all operating expenses, depreciation annuity, interest on bonds and all dividends on stock, including eight per cent on its common stock, and still leave a modest surplus.

Idaho Company Claims Error in Commission Rate Orders

Relief from the provisions of recent rate schedule orders of the Public Utilities Commission of Idaho is being sought by the Idaho Power Company. The bill of complaint was filed on July 24 (Journal of Electricity, page 105, Aug. 1, 1924) and alleges that the commission's orders are based on three erroneous premises.

First, the company charges that its property has been undervalued by approximately $4,000,000; secondly, it holds that the rate of return allowed by the commission on the valuation set by the commission is too low; and thirdly, it asserts that certain rates, such as those for irrigation power and for heating power, are non-compensatory. The purport of the lengthy bill of complaint is found in the company's "prayer" that the court declare illegal and void, as violating its constitutional rights, certain orders of the commission fixing valuation and rates, and that the company's tariff number seven (filed shortly before the commission's rate orders) be declared just and reasonable, and that an injunction be issued restraining the commission and attorney-general from attempting to enforce the rate orders and from interfering with the company's application of its tariff number seven.

W. R. Putnam, vice-president and general manager of the Idaho Power Company, in a statement to the public explaining the company's action, said in part: "While we had hoped to postpone for some time this action so that the present rates under which the company furnishes service, . . . could be fairly tried out, nevertheless we are confronted with a situation which, in our opinion, requires immediate action." He stated that the court action was precipitated by the commission's recent order to show cause why the rates established by the commission in February this year should not be reduced ten per cent.

Index to Volume LII Published.—The index to Volume LII of the Journal of Electricity, covering issues of Jan. 1, 1924, to June 15, 1924, inclusive, has been printed and is ready for distribution. Copies of the index may be secured, without charge, by addressing Circulation Manager, Journal of Electricity, 883 Mission Street, San Francisco.

City Purchases Colorado Springs Distribution System

After negotiating for a period of weeks, the city of Colorado Springs, Colo., has purchased the electrical distribution system, with the exception of two substations, of the Colorado Springs Light, Heat & Power Company for $600,000. The agreement reached by the representatives of the city and a committee, acting for the bondholders, states that the company is to retain title to substations A and B in the city, though the use of substation A is reserved for the city as long as it is required.

The deal, which gives the city a distribution system within its corporate limits, provides that the company shall continue to operate its system and receive all revenues until the city's steam plant is completed or until Jan. 1, 1926. The city, in the meantime, is to continue to receive an annual rental of $36,000 for the use of its hydroelectric generating plant.

The agreement reached by the city and the utility company provides that all litigation is to be settled at once and that the municipality is to be given title to the company's transmission system from the Manitou hydroelectric plant to the city limits. The contract also stipulates that the claims of the city against the Colorado Springs Light, Heat & Power Company are to be conceded upon the final acceptance of the agreement.

The agreement just reached comes as a final action in the battle between the utility and the city. The fight began when the citizens refused to renew the company's franchise about a year ago. Following this, bonds were voted to finance the construction of a municipal system including a steam generating plant. It is reported that plans are being made now for the steam plant and an additional hydroelectric unit.

Data Book on Central Station Customers Is Published. — Data recently secured and compiled relative to the number of central station consumers has been published in book form by Electrical World. The book gives figures covering population (census of 1920), number of domestic lighting customers, both present and potential, number of commercial lighting customers, both present and potential, and the number of present and potential industrial power customers. The listing is made by counties, every county in the United States being covered. The book is 9 x 12 in. in size and is bound with a heavy board cover. The book is being sold at $15 per copy. The information contained is particularly useful to manufacturers in setting up sales quotas and to advertising agencies.

New Hydroelectric Development Added in Oregon

Portland Electric Power Company Starts First Unit of Large Development on Oak Grove Creek Near Portland

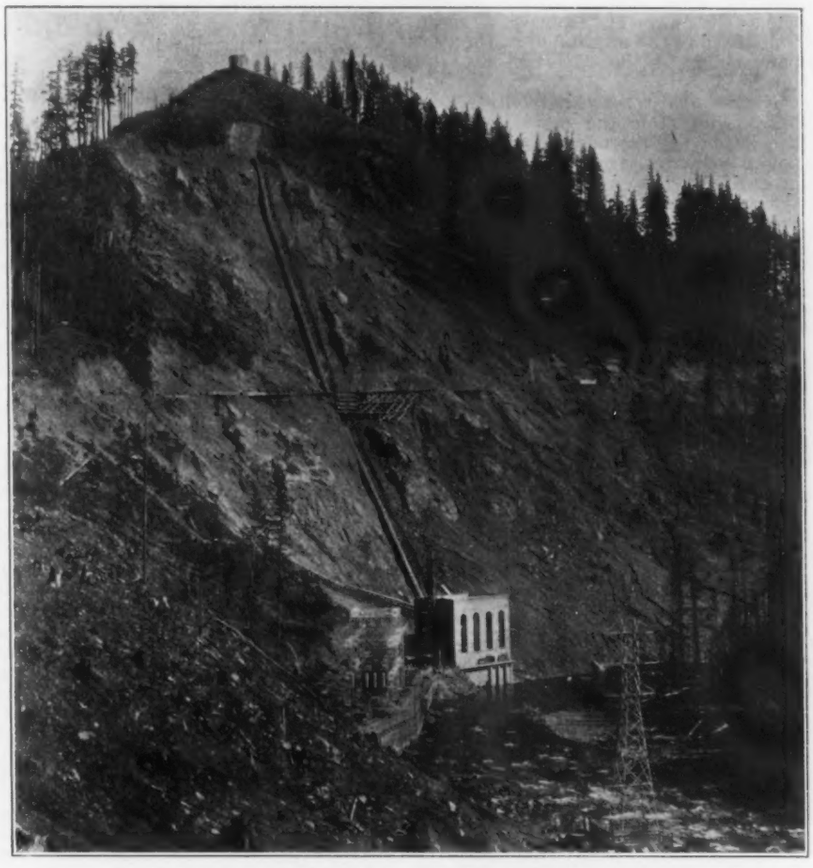
At a time when the water shortage generally prevalent over the entire Pacific Coast is beginning to make itself felt in western Oregon, the Portland Electric Power Company, Portland, Ore., brought in the first unit of its Oak Grove hydroelectric development. Begun three years ago, construction of the Oak Grove project, involving the expenditure of $8,000,000 on the first unit alone, has been carried on steadily until at noon on Aug. 4, the 30,000-kva. generator was synchronized with the other plants of the system, and commenced to pick up load that in recent weeks had been carried only by crowding the steam auxiliaries to a point approximating the limit.

The first unit of the project derives its power from the normal flow of Oak Grove Creek, tributary to the Clackamas River about 20 miles west of Cazadero. An arch type diversion dam of concrete, approximately 190 ft. long and 69 ft. high, sustains a head of 45 ft. The back water created by the dam covers 27 acres.

From this intake the water is carried in a single pressure conduit, 6.6 miles to the summit of Cripple Creek Knoll above the power house, which is located directly below the knoll on the Clackamas River. This pipe is 9 ft. in diameter, and is of 9/32-in. to 11/16-in. steel, fabricated and erected by the Willamette Iron & Steel Works, Portland. For the most part the flow line follows the contour of the ground, except that certain canyons are crossed on steel span bridges, and four hills are tunneled. The fall between the intake and the entrance to the penstock at Cripple Creek Knoll is less than 190 ft., which is the height of the surge tank located there. The conduit is designed to carry 400 sec.-ft.

The penstock, 1,360 ft. long, 8 ft. in diameter at the top and 6 ft. at the bottom, is made of ⅜-in. to 1-7/16-in. steel. At the top is a 66-in. Johnson valve that can be operated from the power house, and that will close automatically in thirty seconds in case of a break in the penstock. At the bottom is a 72-in. butterfly-type valve.

The wheel is an I.P. Morris, Pelton Water Wheel Company, 30,000-hp., 514-r.p.m., vertical, reaction water wheel, and connected to it is a General Electric Company 30,000-kva., 11,000-volt, 60-cycle, 514-r.p.m., a.c. generator, with a 90-kw., 250-volt direct-connected exciter. The static head on the wheel at the power house with no water flowing is 922 ft. The operating head under full load will be 860 ft.



Oak Grove power house of Portland Electric Power Company.

Adjacent to the plant is the steel switch yard and substation, where three Westinghouse, outdoor type, water-cooled, 10,000-kva., three-phase transformers, having five per cent full-capacity taps, are delta-connected to deliver the transmission voltage of 66,000. When the second unit is installed these transformers will be star-connected and will operate at 115,000 volts primary. Connection is made with the present system at the Cazadero plant of the company over a steel-tower transmission line, designed to carry two circuits. This line is 18.71 miles long and is supported by 144 towers of an average height of 72 ft.

An interesting feature of the project is the installation—the first in the Northwest—of a Western Electric Company carrier-current telephone system, from the power house to the company's Station "L," a steam plant in the city of Portland. From here, a metallic phone line completes the connection to the load dispatcher's desk in the Electric Building, so that the dispatcher will have ready and direct communication to the principal plant of the company's system.

Conflicting Application Filed on Green River Site

An application for a preliminary permit covering a 60,000-hp. development at the Split Mountain site on Green River in Uintah County, Utah, has been filed with the Federal Power Commission by A. E. Humphreys, of Denver, Colo., and by J. H. and Mary E. Ratliff, of Vernal, Utah. The proposed project conflicts with plans of the Utah Power & Light Company and would not be of particular interest were it not for the fact that the applicant is known to possess large financial resources.

Mr. Humphreys and his associates propose to develop a head of 160 ft. and to install five units capable of generating 60,000 hp., which is to be used in the manufacture of fertilizer at the nearby phosphate properties of the applicants. In addition, however, it is proposed to divert sufficient water to irrigate 3,000 acres on the east side of Green River and 8,000 acres on the west side of the stream.

The Utah Power & Light Company now holds a preliminary permit and is actively working on the plans for a project at the Flaming Gorge site several miles above Split Mountain. The Split Mountain site probably would be the next step in the power company's plan of expansion. It is anticipated that the power company will oppose the Humphreys' application vigorously. The general information available as to the Split Mountain site indicates that fairly cheap power can be developed there after the Flaming Gorge reservoir has been constructed.

Orders Placed for Copco No. 2 Generating Equipment

Orders for turbines and generators for Copco No. 2 plant of The California Oregon Power Company have been placed with the Allis-Chalmers Manufacturing Company and the Westinghouse Electric & Manufacturing Company, respectively. The latter company will also supply transformer equipment.

The Allis-Chalmers company will furnish the utility with two vertical-shaft Francis turbines rated at 20,000 hp., under 140-ft. net head, at 171 r.p.m. These turbines will be of the Allis-Chalmers circular-section, plate-steel spiral-casing type. "White" hydrau-cones will be used.

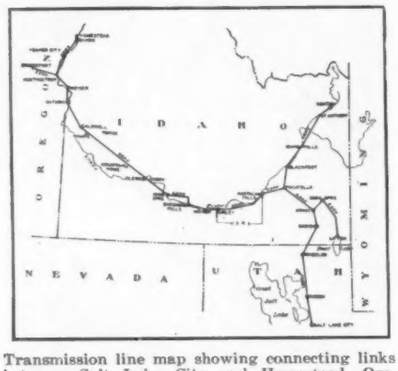
Westinghouse generators of the two-

bearing type, rated at 15,000 kva., 6,600 volts, 171 r.p.m. with direct-connected exciters, will be driven by the turbines. The Westinghouse company will also supply four 10,000-kva. water-cooled, 130,000-volt high-tension, 6,600-volt low-tension transformers and complete high and low-tension switching apparatus for this equipment. The transformers are somewhat out of the ordinary in that they are designed to transform simultaneously 10,000 kva. from 6,600 volts to 130,000 volts and 10,000 kva. from a 66,000-volt tie-line to 130,000 volts.

The California Oregon Power Company expects to have the Copco No. 2 plant in operation by May 1, 1925, the whole output being contracted for by the Pacific Gas and Electric Company. This plant is the third one for which the Allis-Chalmers company has supplied the turbines, the first being Copco No. 1, which comprised two 18,600-hp. units, and the second being a 4,000-hp. unit for the Klamath Falls plant. The latter plant is about ready to be put in operation.

Transmission Line Construction Completes Long Connection

The completion in July of a 33-kv. transmission line between American Falls and a point near Burley, Idaho, a distance of 45 miles, marked the completion of a physical connection in transmission lines between Salt Lake City, Utah, and Homestead, Ore., a total distance of about 500 miles. The line



Transmission line map showing connecting links between Salt Lake City and Homestead, Ore.

was built by the United States Reclamation Service to connect the Minidoka irrigation project with the American Falls plant of the reclamation service, and is of about 2,000-kw. capacity.

The Minidoka project is fed also from the west by a connection with the system of the Idaho Power Company, and from American Falls east and south there is an unbroken line connecting with the system of the Utah Power & Light Company, Salt Lake City.

Sierra & San Francisco Company Purchased by Byllesby

Capital stock of the Sierra & San Francisco Power Company has been purchased by H. M. Byllesby & Company from the California Railway & Power Company. The Sierra & San Francisco Power Company owns a 60,000-hp. hydroelectric plant on the Stanislaus River in Tuolumne County, Calif., a 36,000-hp. steam plant in San Francisco and a high voltage transmission system 850 miles long. The property is at present operated under lease by the Pacific Gas and Electric Company.

The property acquired by the Byllesby company is physically connected with two other companies owned by the Byllesby organization, the Western States Gas & Electric Company, of Stockton, and the Coast Valleys Gas & Electric Company, of Salinas. Ownership of control of the California Railway & Power Company or its affiliated company, the Market Street Railway, of San Francisco, is not included in the transaction.

Judge Decides Power Company May Sue City of Seattle

Another step in its fight with the city of Seattle to collect three-fourths of the municipal street railway tax for 1919, recently paid to King County, was lost to the Puget Sound Power & Light Company, Seattle, Wash., when Judge Neterer of the Federal Court sustained the city's motion for dismissal of the power company's amended and supplemental complaint in a suit pending since June 1. This decision leaves the power company with the option of suing the city for what the company claims is the city's share of the tax paid.

King County recently collected the tax in full from the power company, the latter paying under protest. The power company then brought an action in equity in the United States District Court, in which it attempted to force the city to pay three-fourths of the tax, under the agreement entered into at the time of the purchase by the city of the street railway system. In a later supplemental complaint, the power company asked subrogation for any liens that the state might have had against the street railway property if the taxes had not been paid. The city entered a motion for dismissal, which the court sustained.

In his decision, Judge Neterer held that the special street railway fund is not liable for the taxes sought. He held also that the tax collectors were within their rights in collecting the tax from the power company, and that the latter still has a right to bring a legal action for its share.

City Limits Mark Boundary for Sale of Seattle Power

According to an opinion prepared by Corporation Counsel T. J. L. Kennedy, the city of Seattle has no statutory authority to sell light and power outside its corporate limits. The city council recently passed an ordinance appropriating $11,500 to extend service lines of the municipal light and power plant from Landsburg, the point on the Cedar River where city water is diverted into the pipe lines, to Ravensdale, a distance of 2.6 miles, to furnish power to a coal company. This ordinance is declared void, and Comptroller H. W. Carroll is instructed that in his official capacity, he cannot recognize as valid any claim made under the ordinance.

The opinion points out that Seattle operates its light and power system in a "proprietory or business, capacity, as distinguished from its usual or governmental functions" and would require special legislative authority to market current outside the city's corporate limits.

Colorado River to Los Angeles Aqueduct Being Surveyed

Data on a plan to build an aqueduct that would supply Los Angeles, Calif., with water from the Colorado River is being secured by field and office forces of that city. The work will be finished late this fall and will consist in part of a map on a scale of 1 in. to 10,000 ft., showing the proposed route from a diversion between Blythe and Parker on the Colorado River to reservoirs in the foothills of Los Angeles, a total distance of about 225 miles.

The aqueduct as planned would have a capacity of 1,500 sec.-ft. and would reach its highest elevation at Shaver Summit—elevation 1,700 ft.—which is 70 miles from the intake and about 1,400 ft. above it. The lift to this summit would be made by pumping plants along the 70-mile length of the aqueduct, three or four plants being required. From Shaver Summit the flow would be by gravity. A total of 40 to 50 miles of tunnels would be required in the proposed location. These would be chiefly in short lengths except for one bore near Cabezon with a minimum length of 13 miles. No definite estimate of cost has yet been made.

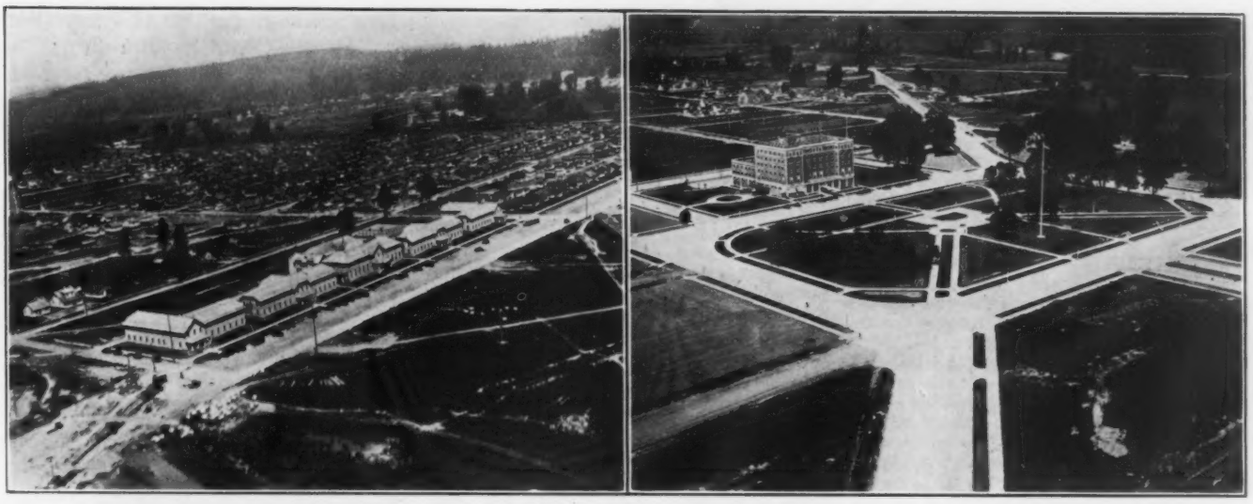
Extensive Underground System Is Planned for Vancouver

For the purpose of improving service conditions in the business section, and of eliminating interruptions, due to short circuits caused by a combination of dust from the mills and moisture from the atmosphere during fogs, in the industrial section, the British Columbia Electric Railway Company, Vancouver, contemplates quite an extensive program of underground construction in that city. Plans for the work are being formulated at the present time. By an agreement with the city two years ago, the company agreed to install its circuits underground in a limited area, but recently it decided to enlarge materially upon the original plan so that a much larger area could be served more adequately.

Although the details of the project have not been worked out definitely, Charles E. Kuhn, underground engineer, who will have charge of the work, states that the general plan includes the underground construction of a 34,000-volt line from the Horne-Payne substation to the Main Street substation, and 12,000-volt feeders from there to various substations in all directions; one to the south section of the city, another west to the Haro Street substation, a third to Point Grey substation, and a fourth to serve the industrial section along the waterfront. Distribution lines will radiate from these stations to cover a large business area of the city.

On account of the magnitude of the project, and the necessity of keeping service on in all districts and at all times during construction, the job will be consummated gradually over a period of years. As yet no complete estimate of the cost has been made.

General Electric Company Publishes Description of Manufacturing Processes. —A well illustrated booklet devoted to a description of the factories manufacturing General Electric Company products has been published by the company. The booklet also presents illustrations of the manufacturing processes.



At the left may be seen one of Longview's residence districts, intended primarily for employees. Jefferson Square, civic center park at Longview, and the Hotel Monticello are shown at the right.

Mammoth Electrical Sawmill Begins Operations

Long-Bell Lumber Company Dedicates First Unit of Gigantic Project Commenced Last Year at Longview, Wash.

What is said to be the largest lumber manufacturing plant of its kind in the world was dedicated recently in a three-day celebration at Longview, Wash., attracting 18,000 to 20,000 visitors from Portland, Ore., Seattle, Wash., and other cities of both states. The erection of the lumber plant involved as a side issue the planning, constructing and exploiting of a modern city that may some day house 50,000 inhabitants. The event celebrated the commencement of lumber manufacturing in the first unit of the Long-Bell Lumber Company's plant, building operations on which were commenced a little over a year ago, on the banks of the Columbia River some 50 miles northwest of Portland, Ore.

The mill, which has a capacity of 500,000 ft. of lumber per eight hours, is electrically driven throughout, being supplied with power from a hog-fuel steam plant located adjacent to the main mill building. Three 6,000-kw. turbo-generator sets supply the mill, the town of Longview and the logging operations of the Long-Bell Lumber Company at Ryderwood, 30 miles north. Space in the power plant is reserved and boiler and auxiliary capacity is provided for three additional 6,000-kw. units, which are to be installed as needed for the growth of the city and in the development of a second manufacturing unit identical with the first. This addition is contemplated in the complete plan of the project.

All the equipment in the generating station is of General Electric Company manufacture, and some of the principal items, beside the generators, are two 300-kw. synchronous motor-generator sets for delivering direct current to the monorail and crane equipment, and two 200-kw. motor-generator sets, one with turbine, to float on the line for emergency service. Station service for pumps and auxiliary equipment is supplied at both 2,200 volts and 460 volts secondary, stepping down through a bank of three 1,500-kw. transformers from the generator voltage of 13,200.

Distribution for the mill is accomplished by 13,200-volt circuits carried underground to four substations situated at different points in the mill from which the secondary voltage is 460 is carried through controlling equipment to the motors. The plant machinery is driven by approximately 600 motors, nearly all the product of the Westinghouse Electric & Manufacturing Company, aggregating a total rated capacity of 13,344 hp. Some of the largest of these are: one of 450 hp. on the Williams hammer hog, two of 300 hp. each on the two head rigs, one of 250 hp. on the gang saw, two of 300 hp. each on the edgers, and three of 200 hp. each on the resaws.

An interesting feature of the mill operation is found in the control equipment, in which the circuits run from the substations through load-center buses, situated at convenient places throughout the mill, where the contactors controlling nearby motors are located. In general all the motors driving transfer rolls and conveyor chains are controlled by push buttons at the operator's stand. The system of handling the lumber throughout the manufacturing process is such as to reduce to a minimum the amount of manual labor required.

The yard, which covers 46 acres and is capable of storing 80,000,000 ft. of lumber in 2,884 piles, is crisscrossed by 30 miles of track. Movement of the lumber will be facilitated by the operation of four 7-ton, Baldwin-Westinghouse electric locomotives equipped with Edison storage batteries. The loading dock for water shipments, with a frontage of 1,400 ft. on the Columbia River,

First unit of the plant of the Long-Bell Lumber Company, showing 18,000-kw. steam plant in right center. A portion of the city of Longview may be seen in the background.

has storage capacity for 40,000,000 ft. of lumber, and is equipped with the largest hammerhead crane in the world.

Some conception of the size of the project in general can be gained when it is stated that the mill site includes 1,737 acres. Twenty-eight buildings have 34 acres under roof, while two log ponds cover 150 acres. The concrete fuel house, supplied with hogged-fuel and sawdust by conveyors and blowers, is 240 ft. x 220 ft., and furnishes storage for 1,215,000 cu. ft. of fuel. Overproduction of sawdust and material that cannot be utilized in the boilers will be disposed of in the largest waste-burner in the world, 100 ft. x 120 ft. The forty dry kilns, one cooling shed, two dry sorter buildings, three rough lumber sheds, two dressed lumber sheds, and two loading sheds constitute the lumber storage and loading units with a combined capacity of 120,000,000 ft. of lumber.

Logging operations centering at Ryderwood are also largely electrified. From a substation just outside the mill property, at which a 13,200-volt circuit coming underground from the steam plant is stepped up to 66,000 volts, the transmission line extends north about 30 miles to a substation where it is stepped down and distributed to movable substations for a second step down to the running voltage of the motors driving the logging donkeys. A standard gage, common carrier railway, the Longview, Portland & Northern, hauls the logs to the mill pond.

Distribution for the city of Longview is accomplished by means of a 13,200-volt line carried to various substations placed in different districts of the city, thence by 2,200-volt distribution lines to the service transformers. Approximately one year ago a few wooden buildings dotted over the meadow and grazing land marked the site of the city of Longview. Today the population is 5,800. There are 90 miles of graded, graveled or paved streets, 17 miles of concrete sidewalks, 22 miles of sewers, 14 miles of water mains and 4 miles of street lighting. Among the 277 business and civic enterprises there are three hotels, two apartment houses, two banks having combined deposits of over a million dollars, a daily newspaper with a circulation of 4,000, 800 homes in six residential districts, and a school with 900 pupils. A $150,000 theater and a $200,000 hospital are under construction.

Further Development of Skagit Urged by Mayor

Claiming that, at the present rate for power, there will be no energy for sale from the present Skagit unit by 1927, Mayor E. J. Brown of Seattle, Wash., has directed the members of the Board of Public Works to make an immediate and thorough survey of the entire Skagit project, and to compile data for submission to the city council to enable that body to consider its further development. Mayor Brown suggests the immediate development of the Skagit project either at Gorge Creek or at Ruby Creek.

In his annual message to the council in June, Mayor Brown urged the early construction of the Gorge Creek masonry dam, but shortly after, while the mayor was out of the city, the council passed a resolution which should halt work on the Skagit development for an indefinite period after the completion of the first unit, from which power is expected to be available by Sept. 1. The mayor now desires that the council reconsider this action.

Commercial Department Changes Made by Colorado Utility

Through the merger of the Colorado Power Company with the Public Service Company of Colorado, the commercial department of the entire organization is being revamped. The Western division of the latter company, formerly the Western Light & Power Company, insofar as the commercial department is concerned, likewise has been placed in the reorganized department.

Charles A. Semrad, vice-president and assistant general manager of the Public Service Company and formerly directing head of the Western division with headquarters at Boulder, has been designated as commercial manager to succeed R. G. Gentry, who has been placed at the head of a new department of public relations.

All of the commercial activities will be directed from Mr. Semrad's office in Denver, it is understood. Assisting him in the operation of the department will be E. B. Ball, formerly commercial manager of the Western division, F. F. McCammon in charge of power sales, R. G. Munroe in charge of gas commercial activities and another executive from an outside Doherty property to direct electric merchandising activities. Minor adjustments in the remaining personnel will also be necessary as a result of these changes, it is reported.

Clare N. Stannard, vice-president and general manager of the company, is now in the East, but this fact will not prevent the further development of policy in connection with the commercial department inasmuch as Thomas L. Kennedy, general commercial manager of the Doherty system, is personally supervising the changes in Denver.

Point in License Termination Brought Out Recently

Action on the part of the Rock Creek Power Company, of Missoula, Mont., in beginning a small amount of construction work on the eve of the expiration of its license covering a small project on Rock Creek in western Montana, has raised the question at the Federal Power Commission as to how such situations can be met.

If construction work is not begun before the expiration of time fixed in the license, the license can be revoked by a simple written order from the commission, but when construction work actually has begun, the license only can be revoked through court proceedings. From a legal point of view, it seems that the licensee will have complied with the letter of the law if he makes a few scratches on the project. While advantage may be taken of the law in this regard, the feeling at the commission is that a change in the law is unnecessary since the licensee is throwing away a portion of the time allowed for completion. It will be possible for the commission to terminate the license on the latter date. If another applicant who is prepared to make the development promptly should appear, an injunction then could be sought.

Use Emblem in Tile to Ornament Power Company Buildings

The San Diego Consolidated Gas & Electric Company, having adopted as a standard for all of its new buildings the Spanish type of architecture, has not only made use of tiles to decorate those new buildings, but has worked its emblem into tile for use in cornerstone insignia upon each of its properties. The emblem of the San Diego Consolidated Gas & Electric Company, designed some two or three years ago by R. C. Cavell, superintendent of the record department, and executed by Philip E. Myers of that department, consists of a lamp post, lighted by the word "Service" and contains the company name. To adapt this to a cornerstone at first presented a problem until the idea of using tile was conceived.

The new standard insignia of the San Diego Consolidated Gas & Electric Company as applied to all new buildings erected by the company.

Upon a large bronze frame, about 3 x 5 ft. in size, the tile insignia is set. A bronze plate bearing the Byllesby Engineering & Management Corporation legend is placed directly underneath it, and the year in which the building is erected is to be found immediately below. The whole emblem is illuminated at night by an electric light concealed beneath an especially designed wing device at the top of the plaque.

Eastern Oregon Range Campaign Successful.—The electric range educational and sales campaign of the Eastern Oregon Light & Power Company, Baker, Ore., is reported to have been quite successful. In the first three weeks of the campaign 29 ranges were installed. Contractor-dealers have also reported that the sales of ranges have been satisfactory and that more wiring for electric heating is being done this year than was last. Miss Grace Bogue of the Westinghouse Electric & Manufacturing Company has been giving demonstrations of the electric range to assist in the sales campaign.

Electrical Inspectors Conduct Meeting at Long Beach

At the two-day convention held in Long Beach, Calif., by the California Association of Electrical Inspectors, San Francisco was chosen as the next meeting place of the convention which will be held some time in March. The present officers of the association were re-elected with the addition of R. W. Albright, city electrician of Long Beach, as first vice-president. The selection of San Francisco for the next convention is in conformity with an agreement to hold meetings in the northern and the southern parts of the state alternately.

During the morning session of the second day, standardizing of electrical installation throughout the state was discussed. The organization is co-operating with the State Industrial Accident Commission to plan safety measures for places of employment. It is worthy of note to know that the plans of the industrial accident commission were prepared by a committee composed in its entirety of members of the inspectors' association.

Social features of the convention were many. In the afternoon about eighty-five were taken on a boat ride through the harbor as the guests of the Chamber of Commerce. In the evening a dinner and entertainment program were given the delegates and their wives at the club house in Recreation Park. A ladies' entertainment committee composed of Mrs. O. W. Newcomb and Mrs. Clyde Baty entertained the ladies of the delegation while the business sessions were in progress.

The officers of the association are: H. W. Stitt, Fresno, president; R. W. Albright, Long Beach, vice-president; C. W. Mitchell, San Francisco, secretary and treasurer.

Salt Lake City Electric Pumping Plant Put in Service

A new electrically-operated pumping plant for Salt Lake City, Utah, was formally placed in operation during the latter part of July, and is proving an appreciable factor in augmenting the city's water supply. The plant is located southeast of the city, near the mouth of Big Cottonwood Canyon, and supplies irrigation water from Utah Lake to farmers, in exchange for mountain water from the canyon. About 5,000,000 gal. per day is being added in this way to the city's water supply.

The installation consists of two pumps, one being a 12-in., double-suction, bronze impeller, centrifugal, with a capacity of 4,500 gal. per minute, against a 200-ft. head, driven by a 350-hp., 2,300-volt motor. The other is a 16-in. pump of the same general description, with a capacity of 7,200 gal. per minute, and driven by a 500-hp. motor.

The pipe line is approximately 6,950 ft. in length, of 30-in. continuous wood staves, creosote treated. The pumps are capable of delivering about 17,000,000 gal. of water every twenty-four hours.

The General Electric Company has recently issued a very attractive booklet on "The Splendor of Well Lighted Streets." The book contains considerable interesting information on the manufacture of lamps and their application to street lighting.

Directors Approve Construction of Baker River Project

Approval of the plans for the Baker River hydroelectric project of the Puget Sound Power & Light Company and the appropriation of the necessary funds to erect the first unit have been made by the board of directors of the company. The preliminary work on the project is practically completed and it is the intention of the company to have the first unit in operation by November of 1925.

The Baker River development is to be situated on a site near the town of Concrete, Wash., and will have an ultimate installed capacity of approximately 45,000 hp. The estimated cost of the development has been placed at $5,000,000.

The Puget Sound company is at present installing a new unit in its White River plant which will increase the capacity of this installation by 23,000 hp. The cost of this development work is about $1,000,000. Present plans call for the completion of this work in November of this year.

Sacramento Proposes Dam on American River.—One thousand eight hundred dollars has been voted by the city council of Sacramento, Calif., to procure an accurate survey of the site on which the city proposes to erect a 200-ft. dam. The dam site is on the American River above Folsom. According to preliminary estimates the dam would impound 400,000 acre-ft. of water and it is maintained would provide Sacramento with a domestic water supply and provide irrigation for 175,000 acres and a seasonal supply of hydroelectric power. The erection of the dam was originally planned as a flood control measure.

Steam Plant Lease Sanctioned by California Commission.—The California Railroad Commission has approved the contract between Pacific Gas and Electric Company and the California and Hawaiian Sugar Refining Corporation for the leasing by the former from the latter of a steam electric generating unit at the Crockett plant of the sugar company.

The Roller-Smith Company, New York City, has issued bulletin No. 160 descriptive of its new line of portable, type GSA, alternating current measuring instruments.

Books and Bulletins

ELEMENTS OF ELECTRICAL DESIGN

By ALFRED STILL. 535 pages, 215 figures. $5.00. Published by McGraw-Hill Book Company, Inc., New York, N. Y.

A student of electrical engineering should not only study the theory and application of electrical machinery and allied equipment, but should also obtain some information covering the elementary principles of the design of such machinery. According to the author this book is an attempt to provide the student with a text in which the problems of the designing engineer are used to illustrate the application of fundamental laws in the design of practical machines and apparatus.

This book is a treatment of the elements of electrical design and the earlier chapters deal with resistances and I^2R losses covering the electric magnets; the magnetic circuit as applied, for example to the design of electric magnets; and the electrostatic circuits using the design of insulators and static condensers.

In the latter chapters various machines and several types of apparatus are considered. A number of problems are worked out numerically to show how the fundamental principles are applied in the design of practical machines.

A more detailed account of the contents of the book can be indicated by reference to the various chapters. After a short introduction in which suggestions are given for methods of the using of the book as a text, chapters two and three treat of the electric circuit. Chapters four and five give the fundamentals of the magnetic circuit and the design of electromagnets. The next chapter is devoted to the dielectric circuit with a treatment of insulator design such as porcelain and condenser type bushings and insulation of transformer windings and the design of underground power cable. Then follow the chapters on the design of direct current machinery with about one hundred and forty-two pages allotted to the subject. Five chapters covering one hundred and forty-eight pages are then devoted to the designs of rotating alternating current machinery. Next follows a chapter on the elements of design of alternating current transformers and the book concludes with a short chapter on the mechanical design of electrical machinery.

In explaining procedure in design the author has attempted to base all arguments on scientific facts and to build up a design in a logical manner from known fundamental principles. As stated before, this book is intended for the student. It does not contain a collection of design constants and other information for the experienced designer, nor does it give data covering the dimensions, weights and performances of modern machines. It does, however, present a method of design which should yield satisfactory results when developing new types of machines or when existing patterns or tools are not a factor to be considered.

Throughout the book the author urges the student to obtain a concrete mental conception of the hidden actions going on in the machine which produce visible results which can be measured. The drawings, which are excellent, and the explanations are presented on this basis. For example, in the design of electromagnets and high voltage insulators it is urged that the reader picture the imaginary flux lines and the equipotential surfaces which are everywhere normal to the direction of these lines. Also in studying the action of generators and motors the electromotive forces developed in the armature windings are represented throughout the book as being due to the cutting of imaginary lines of flux by the conductors. Test problems given at the end of each chapter should add to the usefulness of the book for class room work.

E. R. S.

Meetings

Illumination Design Schools to Be Held in California

Illumination design schools, to present those in attendance with the fundamentals and basic principles of modern lighting, are to be conducted in California by the Lighting Bureau of the Pacific Coast Electrical Association during September. The first school will be held in the auditorium of the Pacific Gas and Electric Company Building in Oakland, Sept. 22-26, and the second one will be held in the Contractor-Dealers' Association Building in Los Angeles, Sept. 29-Oct. 3.

A group of illumination engineers has been secured to act as instructors in the schools and the course will involve both theory and practice. Each class will be limited to 50 members in order that individual attention may be paid to the students. No one will be accepted who cannot give his full time to the work during the time that the school is being held. Invitations to the school are to be sent to contractor-dealers, builders, architects, engineers and the jobber and central station salesmen.

Preliminary plans for the school indicate that there will be no charge for the course, except possibly a nominal registration fee to be determined at a later date. To insure the attendance of the students a $10 deposit will be required, which will be returned at the conclusion of the course, if attended regularly, but will be forfeited at the rate of $2 for each day missed.

The tentative curriculum for the course has been set as follows:

Perspective or scope of modern illumination.

Fundamentals and definitions involved in illumination calculation.

Practical problems in simplified illumination design.

Problems in industrial lighting.

Survey of an actual industrial lighting problem.

Preparation of plans on industrial problems.

Study of kinds and types of lamps, and how they are affected by abnormal voltages.

Principles of light reflection and diffusion.

Study of different types of lighting equipment.

Study of store, commercial and public interior lighting.

Study of window lighting.

Application of color lighting.

Study of intensities and foot-candle meter.

Study of lighting problems for offices, drafting and school rooms.

Principles of street lighting.

Explanation of lighting and safety codes.

Study of value of light for commercial purposes.

Talks on Illumination Engineering Society.

Maintenance of lighting systems.

Contractor-Dealers' Business Is Discussed at Meeting

Better business practice for contractor-dealers and higher wiring standards were the principal subjects of discussion at a recent meeting of northern Colorado electrical men in Fort Collins, Colo. Contractors from that city, also from Loveland and Windsor were in attendance along with representatives of the Public Service Company of Colorado from each of those communities.

The meeting was arranged by Frank Johnson, city electrical inspector, and through his efforts the mayor of Fort Collins, several architects and representatives from the electrical department at the state agricultural college were present. A. L. Johnston of the Fort Collins Electrical Supply Company presided.

The new National Electrical Code was explained by L. A. Barley, chief engineer of the Mountain States Inspection Bureau, and S. W. Bishop, executive manager of the Electrical Cooperative League of Denver, discussed better business practices as applying to electrical contractors and the need for higher and more stringent standards in wiring.

Pacific Radio Exposition Will Be Opened on Aug. 16

Presenting one of the largest and most complete collections of radio apparatus ever assembled, the Pacific Radio Exposition will be opened in the San Francisco Civic Auditorium on Aug. 16. The exposition, which is being sponsored by the Pacific Radio Trade Association, will be open until Aug. 21.

Approximately 150 booths will be used by over 200 manufacturers to display their products. Virtually every type of receiving set will be exhibited as well as the various accessories. During the time that the show is in progress trade meetings will be held from 10 a.m. to noon each day, and programs will be broadcast every afternoon and evening from a studio on the main stage of the auditorium. The exposition is the first of its kind to be conducted under the cooperative non-profit plan.

COMING EVENTS

Conference of Representatives of Electrical Leagues—
Camp Cooperation IV, Association Island, Henderson Harbor, N. Y.
Sept. 2-6, 1924

Rocky Mountain Division, N.E.L.A.—
Annual Convention—Glenwood Springs, Colo.
Sept. 15-17, 1924

Colorado Public Service Association—
Annual Convention—Glenwood Springs, Colo.
Sept. 15-17, 1924

California State Association of Electrical Contractors and Dealers—
Annual Convention—Santa Cruz, Calif.
Sept. 19-21, 1924

Pacific Division, Electrical Supply Jobbers' Association—
Quarterly Meeting—Del Monte Lodge, Pebble Beach, Calif.
Sept. 25-27, 1924

Association of Electragists, International—
Annual Convention—West Baden Springs, Ind.
Sept. 29-Oct. 4, 1924

Illuminating Engineering Society—
Annual Convention—Briarcliff Lodge, Briarcliff Manor, N. Y.
Oct. 27-31, 1924

Rocky Mountain Association Moves Office.—Offices of the Rocky Mountain Electrical Cooperative League have been moved to a permanent location at 626 Kearns Building in Salt Lake City, Utah.

Employees of San Diego Utility Hold Annual Picnic

Employees of the San Diego Consolidated Gas & Electric Company, under the auspices of their Employees' Association, held their tenth annual picnic at Del Mar, July 27. In all respects it was declared the largest and most successful in the history of the association.

Committees organized by Wm. H. Talbott, president of the Employees' Association, made possible the transportation, feeding and entertainment of 2,500 people, employees of the company, their families and friends. Festivities began with the band concert by the Employees' Association band and included: first-aid demonstration, children's treasure hunt in the sand, airplane stunts by an employee, release of carrier pigeons, races, meter reading and pole climbing contests, and ended up with dancing. Moving pictures of the whole affair were taken by a local theater and shown the week following the picnic. A barbecue constituted one of the main events, and by means of four serving lines, the crowd of 2,500 was served in 55 minutes.

Commercial Section Executive Committee Meets at Fresno

The first meeting of the executive committee of the commercial section of the Pacific Coast Electrical Association was held at Fresno, Calif., on Aug. 1. The meeting was presided over by A. M. Frost, chairman of the committee, and was attended by practically the entire membership.

Among other important matters under discussion was the budget for the ensuing year. This was compiled and submitted to the general executive committee of the association for action. The next meeting of this committee will be held in Los Angeles Oct. 17-18.

City to Purchase Substations for Operation of Railway

Prices and terms on which the city of Seattle may acquire the street railway substations in the city still owned by the Puget Sound Power & Light Company will be announced shortly. A board of appraisers including James Ferguson, for the city, S. L. Shuffleton, representing the Puget Sound Power & Light Company, and A. S. Downey, representing the public, has been appointed and will name the terms upon which the five substations may be purchased.

The stations, by means of which the power company is supplying current for the operation of the municipal street railway, must be acquired by the city before municipal energy to be produced by the Skagit plant can be utilized in place of the current that the city, meanwhile, is purchasing under contract.

Puget Sound Employees Picnic.—More than 700 employees, officials and friends of the Puget Sound Power & Light Company, Seattle, Wash., enjoyed the company's annual picnic at its vacation park at Lake Tapps, recently. Swimming, races, band music, dancing and various contests comprised the day's program. The company furnished transportation to and from the picnic grounds.

Manufacturer, Dealer and Jobber Activities

The Estate Stove Company, Hamilton, Ohio, has opened new display quarters at its original location, 839 Mission Street, San Francisco, Calif. The display rooms in the Furniture Exchange Building will be maintained as usual and a complete sample stock will be carried at the new location.

A. J. Lindemann & Hoverson Company, Milwaukee, Wis., have recently brought out a time and temperature control for use on their "L. & H. Electrics" line of electric ranges. This control embodies several new features and is so designed that it may be attached to ranges originally sold without this equipment.

C. Marsden, who recently purchased the business of the Smith Plumbing & Electric Company, 265 Sherman Way, Van Nuys, Calif., has disposed of all plumbing fixtures and in the future will carry only electrical and radio goods. He is now doing business under the name of Marsden Radio & Electric Company.

T. L. Rosenberg, formerly of the Quality Electric Motor Company, Oakland, Calif., has sold his interest in that firm and has opened a new establishment under the name of T. L. Rosenberg Company, at 419 Webster Street, Oakland.

The Globe Electric Supply Company, 1622 Wazee Street, Denver, Colo., has moved to new and larger quarters at 1843 Wazee Street. The new location has superior trackage facilities as well as greater facility for handling customers' orders.

Curtis Lighting, Inc., have issued a new booklet on "Store Lighting with X-Ray Reflectors." This book contains illustrations of applications of this type of equipment and also shows useful information on the planning and execution of proper show window lighting.

The General Electric Company, has brought out a new thermal overload relay designed to follow more closely the heating curve of the motor. The device is designed to afford better protection against overheating of the motor and is made in both single and double pole types.

The F. W. Wakefield Brass Company, Vermillion, Ohio, has recently brought out a new "Red Spot" store lighting unit especially designed for central station sales campaigns. The unit includes a canopy extension, with knockouts; a special mounting for individual pull switch and a screwless holder.

Harvey Hubbell, Inc., Bridgeport, Conn., have recently brought out a new switch plug that combines a pendant push button switch and a handy convenience outlet. The slots of the outlet provide for the attachment of any lamp socket device such as flatiron, percolator, etc.

The Square D Company, Detroit, Mich., has issued a new circular descriptive of the Square D safety switch. The circular is illustrated and contains information of value to contractor-dealers.

The Superheater Company, New York, N. Y., has recently published a booklet devoted to a history of the manufacture of Elesco superheaters. The development of the superheater for locomotive, marine and stationary steam engines is also covered.

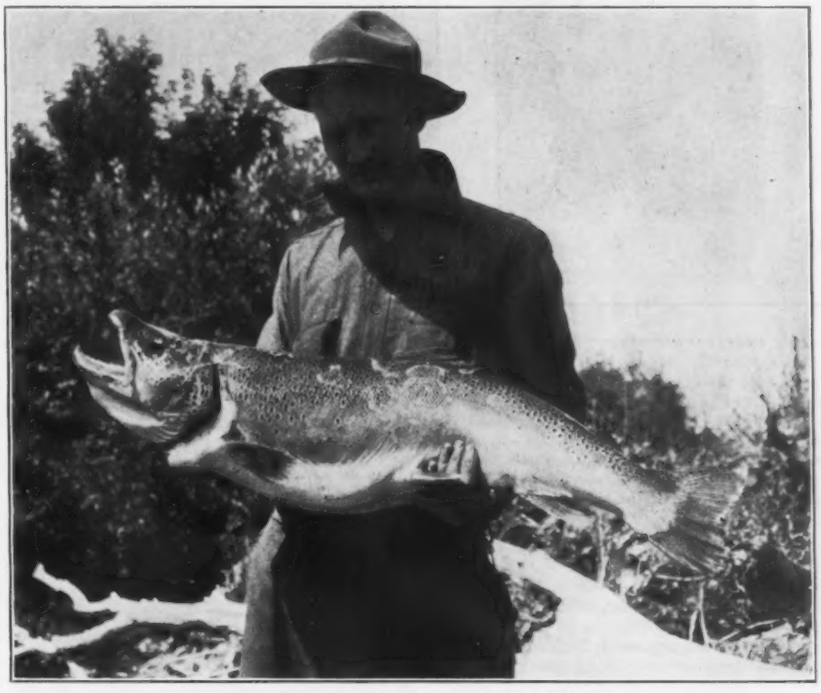
Fulton Iron Works Company, St. Louis, Mo., has prepared for distribution Bulletin No. 806 entitled "The Fulton-Diesel in Industry."

Roller-Smith Company, New York, N. Y., has published a supplement to Bulletin No. 400. The leaf is devoted to the company's line of d.c. switchboard instruments, Type TD. The instruments described in the supplement are 3½ in. in diameter. The company has also issued Bulletin No. 40 which is devoted to its line of Type PV radio voltmeters.

The Reliance Electric & Engineering Company, Cleveland, Ohio, has issued bulletin No. 2016 giving information on Reliance planer motors for reversing service. The book contains many interesting illustrations of applications of these motors and also has much valuable technical information.

The Sangamo Electric Company, Springfield, Ill., has issued a new catalog on Instrument Transformers. The book contains considerable valuable engineering information as well as performance curves and prices.

The Wagner Electric Corporation has just issued an interesting catalog of the "Pow-R-full" line of starterless motors. The book contains considerable useful information relative to this type of motor and will be sent upon application to the manufacturer.



W. W. Smart, superintendent of the Utah Power & Light Company's Logan, Utah, plant on Logan River, is seen in the above picture proudly displaying a large German Brown trout, caught by him on July 17 in the company's reservoir near its Logan plant. The fish actually weighed 25 lb. 5¼ oz. and measured 37½ in. in length, and is believed to be the largest trout of this species ever caught in the United States. The catch was made with an ordinary fly-rod, using a "bull-head" as bait. (Immediately upon receipt of the above photograph, the Editors purchased tickets for Logan in order to arrive before the crowd that is to follow upon publication of the picture. Too bad we've gotten a head start.)

The Westinghouse Electric & Manufacturing Company has recently published a 56-page booklet entitled "High Voltage Porcelain Insulators — Their Design and Manufacture." This publication has been issued for the purpose of presenting to engineers responsible for the design, installation and maintenance of high-voltage transmission systems, information describing the design and manufacture of porcelain insulators. The publication is so comprehensive that it is essentially a text book on the subject of high voltage insulators.

The Bakelite Corporation, New York City, has issued a new catalog on moulded Bakelite. The book contains many illustrations of the different forms and uses of this material.

The Surgex Manufacturing Company, Oakland, Calif., has brought out a new electric dish washer for commercial use which is stated to have many advantages over types of machines now in use.

The Stephens-Adamson Company, Aurora, Ill., has issued a new booklet descriptive of electric car pulleys, conveyor equipment, crushers and the various other lines manufactured by the company.

The National Metal Moulding Company, Pittsburgh, Pa., has issued a new circular to the trade descriptive of cable and loom boxes, saddles and box bars. The circular is illustrated and is descriptive of the application of these various devices.

Personals

Robert J. Graf, vice-president and secretary of H. M. Byllesby & Company, has been appointed president of the San Diego Consolidated Gas & Electric Company, San Diego, Calif. Mr. Graf's long association with Col. H. M. Byllesby, for whom he was for many years private secretary, has made him familiar with all of the Byllesby projects on the Pacific Coast. Mr. Graf went to Chicago with Col. Byllesby when the latter founded his organization in 1902 and was first secretary of the company, an office he still holds in addition to being first vice-president. His ability in banking and finance has long been a recognized factor to the growth of the Byllesby organization and he has had full charge of the books, accounts, issuance of securities, trust deeds and indentures, etc. Mr. Graf has visited San Diego and the Pacific Coast on numerous occasions and is personally familiar with both the company and the territory served. While aggressive and direct he is at the same time democratic and what is popularly known as a good mixer. His recreation is golf.

ROBERT J. GRAF

A. J. Calloway, who for the last four years has been manager of the Salt Lake branch of the Western Electric Company, has been promoted to the management of the Indianapolis, Ind., office of the company. Mr. Calloway graduated from the University of Colorado in 1912, when he received a degree in electrical engineering. He has been connected with the Western Electric Company almost continually since his graduation, and prior to his connection with the Salt Lake office he was connected with the San Francisco, Calif., and Chicago, Ill., offices. Mr. Calloway has been very active in civic affairs during his residence in Salt Lake City.

C. Randolph Currier has taken a position as sales engineer with S. Herbert Lanyon, manufacturers' representative, Call Building, San Francisco, Calif. Mr. Currier is an electrical engineer, having graduated with the class of 1924 from University of California.

J. J. Barry, vice-president and general manager of sales of the General Electric Company, Schenectady, N. Y., is visiting the Pacific Coast. He has spent some time in San Francisco, Calif., and will visit other Coast cities before returning to his headquarters.

P. F. Ross, Pacific Coast representative of the A. J. Lindemann & Hoverson Company, Milwaukee, Wis., manufacturers of the L. & H. line of electric ranges and appliances, is making an extended trip to Portland, Ore., Seattle and Tacoma, Wash., and other Northwestern points. Mr. Ross will also probably visit the factory before returning to San Francisco.

E. W. Hewitt, manager of the Airdry Company of California, is visiting the factory of the company at Chicago, Ill.

H. H. Allison, for some time illumination sales engineer of the Pacific Gas and Electric Company, San Francisco, Calif., and more recently connected with the sales force of the National Lamp Works, Oakland, Calif., has been made manager of the lighting department of the Electric Appliance Company, San Francisco.

N. M. Hope, formerly with the Electric Appliance Company, San Francisco, Calif., has joined the staff of the California Electric Construction Company, San Francisco.

H. H. Courtright, of the Valley Electrical Supply Company, Fresno, Calif., was in San Francisco early in the month in the interests of his company.

Carl A. Wolfrom has been made manager of the Provo division of the Utah Power & Light Company, Provo, Utah, succeeding Ray Timmerman, resigned.

L. R. Graham, of the Stevens Sales Company, Salt Lake City, Utah, recently attended the meeting of jobbers' salesmen of the National Lamp Works held at Cleveland, Ohio.

T. E. Fitzsimons, representative of the Westinghouse Lamp Company at Denver, Colo., has been transferred to the Los Angeles, Calif., office of that company.

Ray Timmerman, manager of the Provo division of the Utah Power & Light Company, has resigned to accept a position with the Adirondack Power & Light Corporation, Schenectady, N. Y.

John T. Janette, manufacturer of electric motors, Chicago, Ill., was a recent visitor to San Francisco, Calif.

E. C. Gribble, president of the Electrical Specialty Company, San Francisco, Calif., has just returned from an automobile trip to Portland, Ore., Seattle, Wash., and various Canadian points. At Seattle Mr. Gribble met his brother, W. A. Gribble, Northwestern manager for the company, and spent some time with him.

Emory Sherwin, who for two years has been assistant superintendent of electric distribution and transmission, for the San Diego Consolidated Gas & Electric Company, San Diego, Calif., was transferred in July to be assistant superintendent of electric production of the same company. Mr. Sherwin was advanced to fill the vacancy made by the departure of **M. C. Wheyland,** who went with **H. H. Jones** to Minneapolis, Minn. **A. S. Glasgow,** former district agent at Oceanside and recently Mr. Sherwin's assistant, was advanced to be assistant superintendent of electric distribution.

Wm. H. Talbott, superintendent of the electric meter department of the San Diego Consolidated Gas & Electric Company, San Diego, Calif., has been appointed chairman of the safety rules committee of the technical section, Pacific Coast Electrical Association.

Arthur A. Brown, manager of syndicate operations of the Westinghouse Electric & Manufacturing Company, New York City, is visiting on the Pacific Coast in the interests of the Lighting Educational Committee.

J. N. Hickerson, of the General Electric Company, is making a tour of the Pacific Coast in connection with the activities of the Lighting Educational Committee.

Thomas W. Nixon has been appointed successor to T. E. Fitzsimons, of the Westinghouse Lamp Company, Denver, Colo., Mr. Fitzsimons having been transferred to the Los Angeles, Calif., office of the company.

Frederick H. Reid, former vice-president of the Southern Bell and Cumberland Telephone & Telegraph companies with headquarters at Atlanta, Ga., has been elected president of the Mountain States Telephone & Telegraph Company, with general offices in Denver, Colo. He has taken the place of Ben S. Read who assumes the presidency of the two southern companies with which Mr. Reid was connected. Mr. Reid, who took over his new responsibilities recently, began his telephone career with the Denver company more than twenty years ago as a clerk in the office of the general superintendent. He rose, in successive steps, to the positions of chief clerk to the superintendent, chief clerk to the general manager, assistant to the vice-president and general manager, assistant general manager and finally general manager. This position he held when, two years ago, he was elected vice-president of the two southern companies. He is one of the youngest executives in the Bell system to be made president and one of the oldest in experience. The territory embraced by the Mountain States Telephone & Telegraph includes Colorado, Wyoming, Montana, Utah, Idaho, Arizona, New Mexico and the El Paso territory. This district comprises 26 per cent of the area of the entire country. Mr. Reid is a native of Scotland but came to Denver with his parents when he was ten years old. He received his early education in Denver schools.

FREDERICK H. REID

William H. Rose, of the Southern California Edison Company, Los Angeles, Calif., was recently in San Francisco on business.

Alex. Miltenberger has been made Western executive representative of the Wagner Electric Corporation, St. Louis, Mo.

Clare N. Stannard, vice-president and general manager of the Public Service Company of Colorado, Denver, Colo., is on an extended trip to the East. Mr. Stannard will visit the Eastern offices of the company before returning to Denver.

Richard A. Hart was elected president of the Utah Society of Engineers, at the annual election held jointly with the Utah section of the American Institute of Electrical Engineers. Mr. Hart graduated from the University of Utah in 1907, with a B.S. degree in electrical engineering. For a number of months following his graduation he was located at Schenectady, N. Y., with the General Electric Company. In the summer of 1908 he returned to Utah to take up work with the state engineering department in connection with reclamation projects on the Spanish Fork River. In June, 1908, he became associated with the United States Department of Agriculture, handling engineering work in connection with the drainage of lands, with which department he has been connected ever since. In 1912 Mr. Hart secured his professional degree in civil engineering at the University of Utah, and was later appointed senior drainage engineer in the United States Department of Agriculture, with headquarters at Salt Lake City, which position he now holds. In his capacity of senior drainage engineer Mr. Hart engages in research work as to the possibilities of reclaiming arid and alkali

RICHARD A. HART

lands; the organization of drainage districts for conducting such work on a community basis on a large scale; the rendering of consulting aid to individuals and projects in drainage and reclamation; rendering of consulting aid in the formation of laws under which drainage districts can be organized, wording of contracts, and also the financing of projects and the aiding of boards of directors in the administration of projects. Mr. Hart is active in the affairs of the Utah Society of Engineers and the Engineering Council of Utah, and is also a member of the American Society of Civil Engineers.

J. M. Hickerson, of the General Electric Company, Schenectady, N. Y., is a recent visitor to San Francisco, Calif.

Samuel Kahn, general manager of the Western States Gas & Electric Company, Stockton, Calif., was recently in San Francisco on business for his company.

P. H. Booth, Pacific Coast sales manager of the Edison Electric Appliance Company, Los Angeles, Calif., was recently in San Francisco. During his stay in that city Mr. Booth attended a meeting of the Lighting Educational Committee.

J. G. Creighton, of Creighton, Morris, McCorkle Company, Portland, Ore., was recently in San Francisco, Calif., on business. Mr. Creighton was formerly connected with the Oakland, Calif., office of the company but has for about two years been manager of the northern district.

Eric Wilburn Smith, central station salesman and assistant manager of the General Electric Company, St. Louis, Mo., has joined the staff of Ray D. Lillibridge, Inc., engineers and general advertising agents, New York City. Mr. Smith will devote himself particularly to furthering the interest of the company's clients in the electric light and power industry.

J. P. Pulliam, president, **A. G. Carson,** assistant to the president of the Eastern Oregon Light & Power Company, and **John Soevig,** of Soevig & Hiscox, all of Milwaukee, Wis., were recently in eastern Oregon viewing the properties of the company.

David E. Drake, for over fifty years in the electrical business, thirty-four of which were spent in the employ of the Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa., has been retired at the age of seventy-six. Mr. Drake will make his home at San Diego, Calif.

Richard T Sullivan, of the Tacoma Light & Power Company, Tacoma, Wash., was a recent visitor to San Francisco, Calif.

John J. O'Brien, formerly vice-president of H. M. Byllesby & Company in special charge of financing, has been elected president of that company to succeed the late Colonel H. M. Byllesby. He was also made president of the Standard Gas & Electric Company and of the Northern States Power Company, both of Chicago, Ill. Mr. O'Brien was born in Chicago in 188, and received his education in the public schools of that city. In 1887 he took his first position in the business world with the Pullman Company. Two years later he joined the United Edison Manufacturing Company, later known as the Edison General Electric Company, which in 1892 was merged with the Thomson-Houston Electric Company. The final outcome of that consolidation was the present General Electric Company, and Mr. O'Brien was in charge of accounting in its Chicago office in 1902 when he left to become associated with Colonel Byllesby. H. M. Byllesby & Company was organized at that time, and Mr. O'Brien became treasurer and general auditor. Since then he has been active in the upbuilding of the company, and has served with the colonel and Arthur S. Huey, recently elected chairman of the board of directors, on the executive committee vested with full administrative and executive authority over the affairs of the company.

Amos H. Feely has recently been employed as secretary of the Electrical Contractors' and Dealers' Association of San Diego, Calif. Mr. Feely was born in Brooklyn, N. Y., March 4, 1884. He entered the electrical industry in November, 1897, being employed by Henry Krantz, now the H. Krantz Manufacturing Company. In November, 1898, he entered the employ of the Ward-Leonard Electric Company at Bronxville, N. Y., where he remained until September, 1902. He then changed to inside construction work for Charles L.

AMOS H. FEELY

Eidlitz & Company, obtaining his first experience in building construction on the New York Stock Exchange. Mr. Feely came to California in 1908. From 1918 to 1921 he represented the Marine Electrical Workers at San Francisco, Calif. During the last two years he has represented Local Union No. 340 in Sacramento, which position he resigned before affiliating himself with the San Diego contractors' association.

Ernest L. Dee, of the Salt Lake City, Utah, office of the Edison Lamp Works of the General Electric Company, recently attended the meeting of district lamp managers held at Camp Edison, Association Island.

Obituary

John S. Eastwood, originator of the concrete multiple arch dam, was drowned in the Kings River on Aug. 10. Mr. Eastwood was internationally known as an engineer and won prominence in the engineering world through his adaption of the arch to concrete dams. Mr. Eastwood had contributed frequently to the Journal of Electricity, presenting articles of engineering interest.

Leon M. Hall, Nevada mining engineer and the man who electrified the mines and mills on the Comstock Lode, died recently at Virginia City, Nev. Mr. Hall was fifty-eight years old and had for several years been active in Nevada mining circles.

Trade Outlook

San Francisco

Reduced lamp prices, effective July 1, are stimulating retail sales, and dealers are making added effort to increase volume and so offset the shrinkage in their contract sales realization. Salesmen in all lines report better orders, attributed partly to rumors of price increases and the resultant reaction on somewhat depleted stocks. There was good movement of conduit during July, in larger sizes from 1½ to 3 in.

Activity in the building of houses, stores and manufacturing plants is resulting in increasing business in hardware, plumbing and electrical lines, with sales volume about on a par with that of last year. Improvement is noted in local wholesale and retail business in general, though in certain lines it continues rather quiet. At the same time, orders for fall delivery are encouraging. Good prices are being received for fruit and truck crops, with consequent favorable reaction on buying, which, while still conservative, is better, particularly for fall merchandise.

Export business during the month has increased, good gains being shown in trade both with Mexico and Hawaii. In general, it is felt that the situation throughout this district has made considerable advance toward recovery from the previous dullness.

Los Angeles

Business in Los Angeles showed improvement during the month of July over the previous month, this being true in nearly all retail lines as well as wholesale.

The power shortage has hindered the sale of small electrical appliances to a certain extent, but on the other hand has increased the sale of generating equipment, as shown by the added sales volume of this type of apparatus by the manufacturers. Jobbers and wholesalers report better conditions prevailing than formerly. Radio sales took a decided jump during the month and are much improved over the preceding month, and this in a measure offsets the decrease in the sale of electrical appliances.

Labor conditions are improved, while the agricultural situation is holding its own and is above normal.

Improvement is reported by manufacturers, wholesalers and retailers of men's clothing, partly attributed, on the part of wholesalers, to the necessity for replenishing of retail stocks. Buying continues on a conservative basis. Conditions are less favorable in the women's clothing trade, the sales volume having decreased somewhat. Collections are reported fair to good.

Portland

Whatever changes there have been during the past few weeks have been for the better; in most lines, however, no change is apparent. The seriousness of the unprecedented drought is daily becoming more noticeable. The effect on the power companies is to compel a larger percentage of steam generation. No cases have been reported of the inability of power companies to supply all demands made upon them, though their operating expenses are greatly increased. Most crops, while not equal to last year's yield, will be greater than was expected.

In spite of a somewhat larger lumber output than that of a few weeks ago, due to several large mills starting operations again, prices remain at about the same level. About 90 per cent of the mills of the Northwest are now operating, most of them at reduced capacity. Residence construction continues to go forward in all parts of the city, and during July permits for that type of building constituted more than half the total. As a whole, the figures represent a gain of about 30 per cent over the corresponding period of last year.

Bank clearings for July showed a gain of about 8 per cent as against those for the same month a year ago.

Salt Lake City

Recent advances in the prices of silver, lead and copper promise a remarkable period of prosperity for the mining industry in the Intermountain section, although this industry is already in a very healthy condition. This favorable situation, particularly in the mining field, is reflected to a considerable degree in general business conditions. In this connection it is interesting to note that statistics of 1923 production of silver and gold compiled by the United States mint department and the Geological Survey establish the fact that Utah, with an output of 20,479,550 oz. of silver, was the largest producer of this metal.

Lack of moisture is still causing some concern in the agricultural territory and among the cattle and sheep men, although this situation has been relieved somewhat by rains in some sections, and the outlook is not considered serious. From present indications crops will be fair and prices good.

Retail merchants generally report a quiet period in business at this time. Building material and electrical supplies, however, are active, due to a considerable amount of home building which is under way.

A spirit of optimism prevails, and the general outlook is favorable.

Seattle

A review of the lumber situation for the last week in July, based on reports from 120 mills, shows sales well above production. The feeling among lumber manufacturers regarding fall trade prospects continues rather optimistic. The cargo markets continue dull.

Wholesalers in various lines are optimistic over prospects for the last half of the year. Orders placed by retail distributors show faith in the winter months in nearly all lines. While ordering is for short periods, as has been the case in post-war years, the volume evidences calculations based on a good turnover.

No cessation of local building activity is noted during the past two weeks, and architects generally report a considerable volume of work in the plan stage that is expected to be under construction in Seattle during the fall.

Radio equipment and supplies have featured the recent electrical sales, with demand for this equipment hard to fill because of delayed shipments from the Eastern factories. Volume is expected to increase materially during the fall and winter months, and dealers are endeavoring to stock up at present. Sales to central stations for replacements and extensions have been active.

Denver

Reports from the agricultural districts are more encouraging than for a number of years. Good crops at present market prices are strengthening the rural banking situation. Because of the bumper beet crop, there is considerable concern as to the outcome of the sugar tariff.

Business as a whole is continuing in splendid fashion. Retail sales are holding up in staple lines. Electrical merchandise campaigns are proving very successful. A recent spell of hot weather materially aided the fan business for the season. Radio is marking time but plans are being made for a big rush in the fall when the new superpower broadcasting station will be opened here.

Activity continues in the oil fields of northern Colorado. Considerable interest has been aroused by the recent discovery of natural gas and the possibility of its being piped to the principal cities of the state.

Building permits issued during the first seven months of the present year are greater by $1,971,600 than the permits issued during the same period of 1923. Permits for July totaled $2,174,450.

Spokane

For the first six months of 1924 bank clearings in Spokane showed a slight increase over those of the same period of 1923, and building permits showed an increase of 50 per cent. A general study of business statistics indicates that wholesale houses have realized gains of from 5 per cent to 15 per cent for the first five months of 1924, as compared with same period in 1923.

Wheat sales have been stimulated by the steady advance in price. The reports now coming in from the harvesting centers indicate in every case yields greater than had been anticipated. Profits, due to higher price and lower labor costs, are reported nearly twice as great per acre as in 1923, in spite of the smaller yield. The fruit crop for the whole Inland Empire will also be materially less than last year, but better profits are expected.

Woodworking plants are working at fair output, with a tendency toward reduction. The general feeling is that demand and prices will be improved by autumn.

Mining operations continue on an excellent basis, with no indications of reductions in output. A great deal of new development work is in progress among silver lead properties, and the local stock market is brisk.